DOMESTIC ENGINEERING

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"DOMESTIC ENGINEERING" AS AN INFORMATION BUREAU.

ONE of the pleasant features in the daily work of the editor of "Domestic Engineering" is the opportunity to answer questions propounded by readers and others who look to this paper as an authority on various matters of interest to them.

Hardly a day passes that does not bring with it letters and telephone calls to the number of a dozen or fifteen for all conceivable forms of information. One man wants to know the name of the manufacturer of the Diveke pump, another the formula for dissolving grease from bell traps, another the address of a maker of furnace fittings.

One man wanted to know the name and address of the president of his state association; an association officer wanted the names of all the master plumbers in his state who were not members of the association. Both these men were satisfied with the information we gave them.

Another man wanted material from which to prepare a lecture on sanitary appliances; we were able to offer the use of some fifty-odd lantern slides, the whereabouts of which were known to us.

The "Questions and Answers" department takes care of a large number of technical queries each week—more questions can be answered if readers desire. This department alone has kept several men out of lawsuits because of decisions rendered that aided them in collecting their accounts.

Questions asked concerning the patentability of various devices, though not solicited, have oftentimes, in the answers given by this paper, saved young inventors and others much expense and useless trouble.

This is not an appeal for more questions—it is rather a justification for delays that sometimes occur in the prompt handling of these matters.

We wish to emphasize the fact that we are ready and willing to answer the questions of readers of "Domestic Engineering" to the best of our ability, and that all readers are privileged to use this service as their needs require.

This will not in the least curtail the use of our Classified Advertising page, which, for obvious reasons, must carry with it a charge for the space. The page is becoming more useful with each issue—hardly a Saturday passes without calls by several persons at our office for copies as soon as they are off the press. Positions wanted, positions open, shops for sale, buyers looking for locations, firms desiring manufacturers' agents, both in this and foreign countries, and a host of others, are represented. You are not excluded—and you will find the department a result producer. Try this at the first opportunity—it will pay you.

OUR FRONTISPIECE.

The frontispiece (page 23) is particulary appropriate for the Hallowe'en season. It brings back the days when we, as boys, made merry with the other man's possessions. 'T was easier to destroy or overturn the sanitary appliances of those days, and many a time have we been guilty of such indiscretions. The caption under the illustration is food for thought—those little fellows should be summarily locked up and no longer be allowed to roam at large.

Heating and Ventilating a School Building

The New Ainsworth School, Portland, Oregon, is an Example of Western Practice in This Class of Buildings Brought Down to Date

By JOSEPH GRAHAM

THE accompanying illustrations show the manner of heating and ventilating the new Ainsworth School at Portland, Oregon.

The system of heating and ventilating in this school is typical of the new schools that are being built in Portland, with the exception that this school will not have an air washer. This is on account of its location on a high elevation above the city, a location free from smoke and dust. Each plenum chamber, however, is provided with a water pan with steam coils therein for moistening the air.

The usual size of school buildings in Portland is 22 class rooms. The Ainsworth school has only 8 standard size class rooms. The list of the rooms in the building is as follows:

Ground floor: boiler room, janitor's room, girls' and boys' play rooms, girls' and boys' toilets, and manual training room.

First floor: four class rooms, auditorium, principal's office, teacher's rest room.

Second floor: four classrooms, domestic science room, serving room, boys' and girls' lunch rooms, and library.

The building is fitted throughout with a low pressure, gravity return system of steam heating and ventilating, using the forced blast or indirect fan system of heating and ventilating in conjunction with direct radiation, where required.

The girls' and boys' play rooms and the manual training room on the ground floor; the auditorium, four class rooms, principal's and teacher's rooms on the first floor; the four class rooms, sewing room, domestic science room, and boys' and girls' lunch rooms on the second floor are warmed and ventilated by the fan system, taking fresh air from the outside of the building through a duct under the basement floor. The air is passed through steam heated tempering coils into the fan chamber, from which point the tempered fresh air is forced by an electrically driven blower either through or around the stack of reheating coils; thence to each of the two plenum chambers, and through a system of galvanized iron distributing ducts to all rooms to be heated and ventilated. Mixing dampers are provided in the ducts connecting to both the warm and cold air compartments. The dampers are operated by motors connecting with thermostats placed in the rooms, for maintaining the proper temperature automatically.

The fan installed is a single inlet, double angular discharge, pulley fan operating at about 160 revolutions per minute, and has a rated capacity of 25,000 cubic feet of air per minute at one-half ounce pressure. The fan is secured to a concrete foundation. A 7½ horsepower motor of 1,200 revolutions per minute operates the fan by means of a 6-inch oak tanned leather belt.

In the fan room, in the space between the fresh air intake and the fan, there is installed a bank of tempering coils containing 310 square feet of "Vento" cast iron heaters, 50 inch, 23 sections, 5⅝ inches centers of loops, and leaving a free area of 21 square feet.

The heaters are supported on concrete foundation piers, raising them as high as possible, to allow sufficient room for a by-pass damper underneath, and keeping the bottom 2 feet 6 inches above the water line of the boilers.

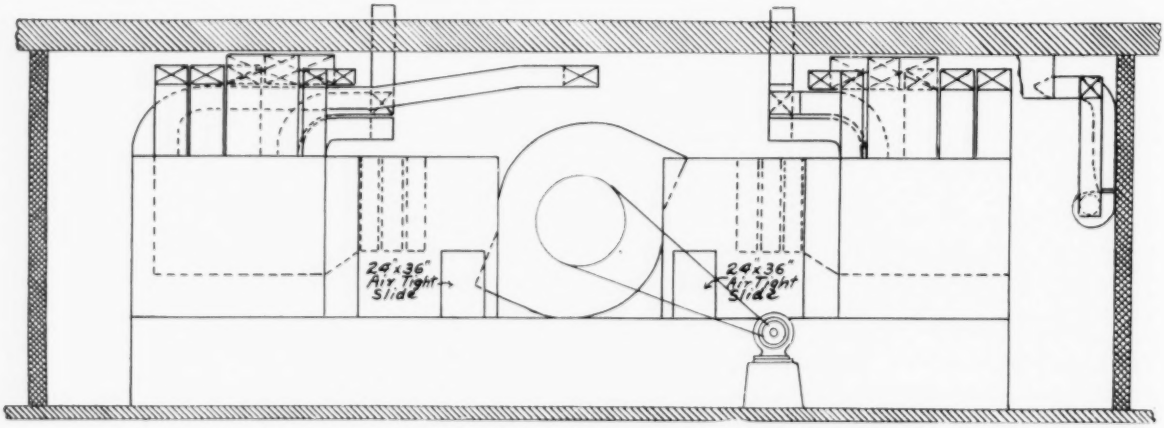
The two plenum chambers are provided with reheating coils, as shown on plan, Fig. 1, consisting of three stacks each of 14 sections of 50 inch "Vento" cast iron blast heaters, supported on 8 inch I beams.

The casings of the tempering coil and the two plenum chambers are made of No. 14 black iron.

The manner of running the supply and return mains, connections, etc., for supplying steam from the boilers to the indirect tempering and reheating coils is clearly shown on the plan, Fig. 1.

Each indirect stack, both in the tempering and reheating coils, is provided with two special extra large automatic air valves, having ¼ inch connections. One of these is placed in an air relief chamber at the return end, while the other is located on the opposite end of the coil on the return end, so as to expel the air from each side of the return end of the heating coil.

In addition to these automatic air valves each coil is



Elevation of Fan and Plenums, Ainsworth School, Portland, Oregon.

provided with a ¼-inch wheel air valve, tapped into the same air relief chamber at the return end in which the automatic air valve is located, so that the operator may operate it by hand to quickly expel the air from the heating coils when heating up.

In general, the air for heating and ventilating the rooms enters at a point 8 feet above the floor level, through specially constructed heads. The openings are provided with deflector plates and grilles for spreading the entering air to all parts of the room as uniformly as possible.

The foul or vitiated air is exhausted from the class rooms through the cloak rooms and thence through vertical flues extending to the roof of the building and discharging to the outside air through ventilators. The vent flues on the north and south halves of the main building are separately connected into two ducts, terminating in round risers carried through the roof.

The vitiated air from the boys' and girls' lunch rooms and the principals' and teachers' rooms is exhausted through their respective toilet rooms, and thence to the vent flues.

The vitiated air from the sewing and domestic science rooms is exhausted directly into a vent flue through grilles in the entries.

The vitiated air from the rear of the auditorium and the manual training room is exhausted into the the vent flues as shown and carried through the roof through round risers. The two vents from the rear of the auditorium terminate in one of these risers. The two ducts from the manual training room are carried through the roof separately.

The plant is so arranged that the engineer may, by closing the dampers in the fresh air intake and opening the doors between the fan room and the hall, and the class rooms and the hall, convert the plant for the time being into a rotary system, so as to recirculate the air for the quick and economical warming of the building in the morning, before it is occupied and a change of air is required for ventilation.

The toilet rooms in the basement are ventilated by means of a special independent fan and system of ducts.

The toilet exhaust fan is supported on a bracket in the

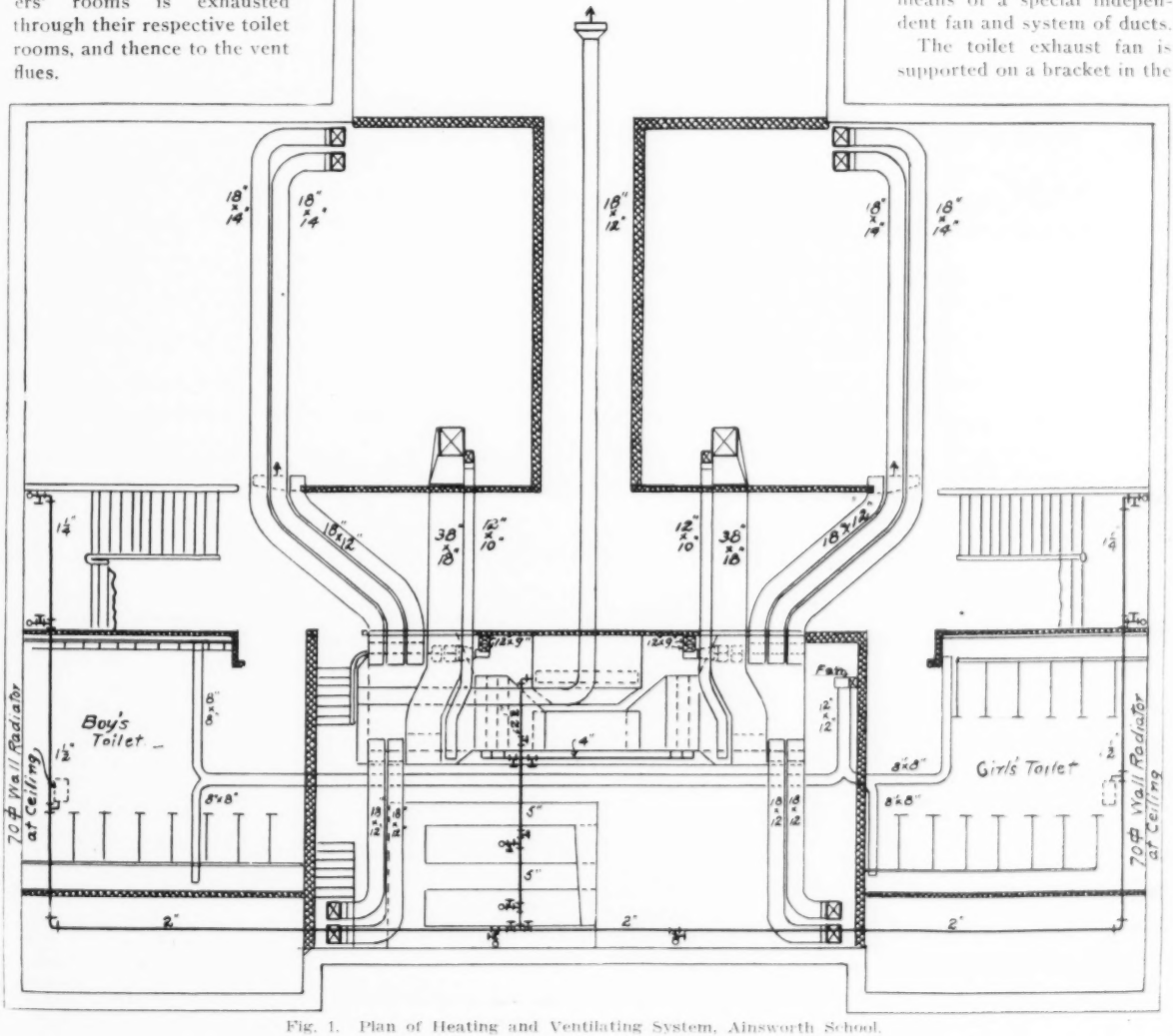


Fig. 1. Plan of Heating and Ventilating System, Ainsworth School.

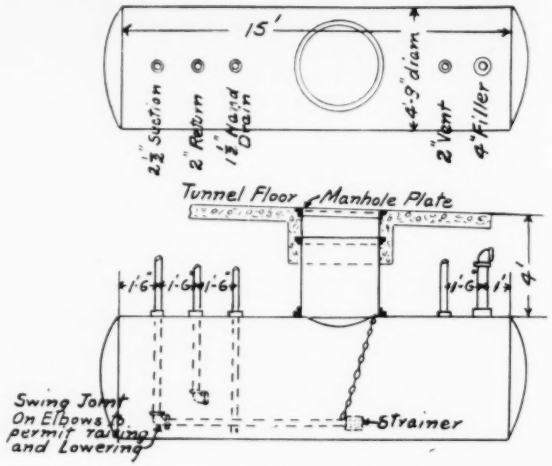
boiler room. It is direct connected to a one horsepower motor running at 1,000 revolutions per minute.

Dampers are provided in the exhaust ducts to properly proportion the flow of air. The dampers on connections at the fan are arranged so that in case the fan is stopped, the attendant may operate the dampers so as to make a direct connection from the toilet rooms to the vent stack.

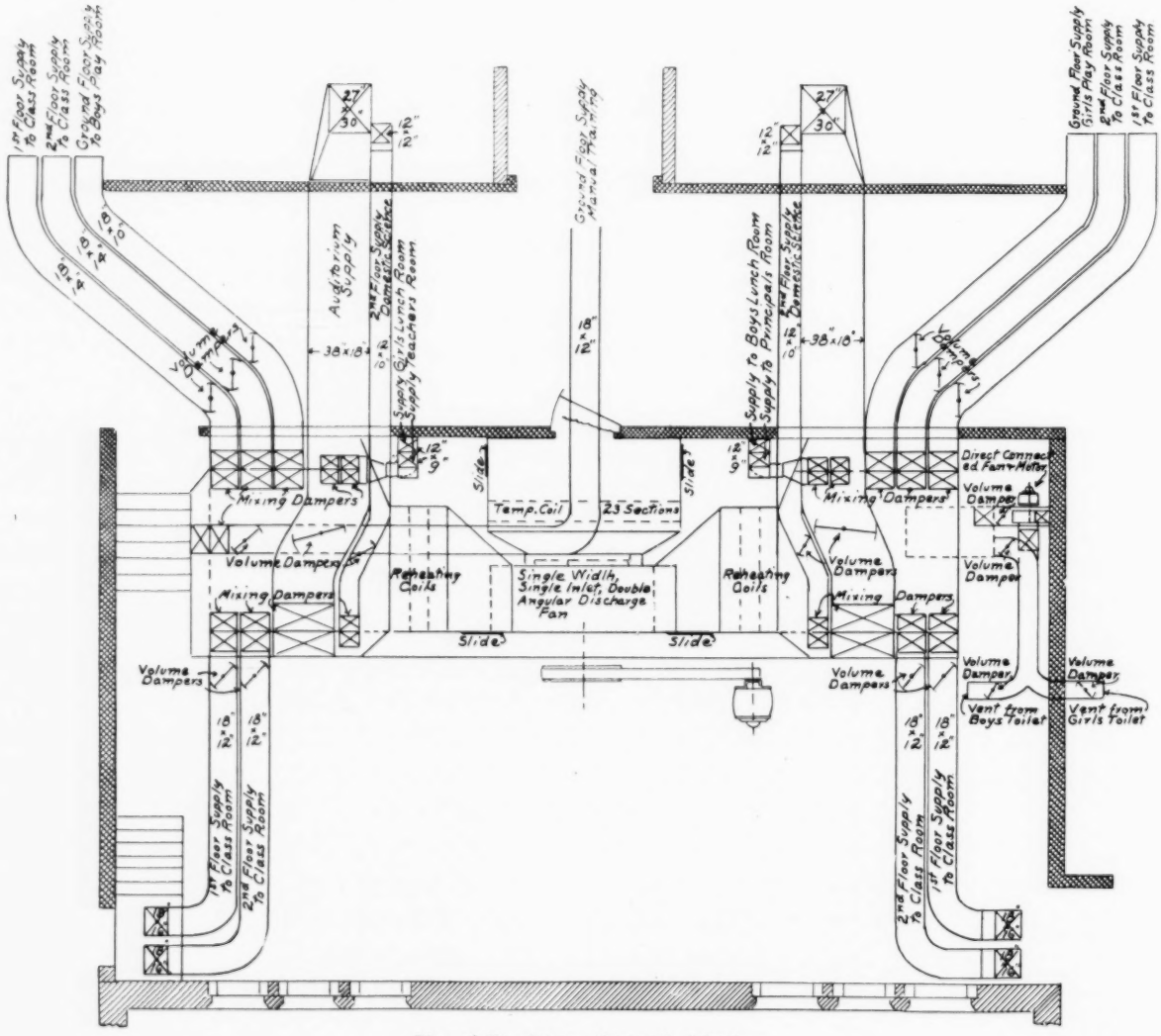
The warm air ducts from the plenum chamber walls to the vertical warm air flues supplying the several rooms are covered with "asbestocel" fireproof paper, one ply. This in turn is covered with asbestos building felt wrapped closely, with lapped joints and all well pasted together.

A complete system of automatic temperature control has been installed, consisting of thermostats, mixing dampers, diaphragm valves, air compressor, diaphragm motors, etc., necessary to control the temperature of the rooms where heat and ventilation is required. The tempering coils are controlled by the temperature in the tempered air chambers, while the reheating coils are controlled by the temperature outside the building.

The corridors, teachers' room, principal's room on the



Fuel Oil Tank, Ainsworth School.


1st Floor Supply To Class Room
2nd Floor Supply To Class Room
Ground Floor Supply To Boys Play Room
Auditorium Supply
2nd Floor Supply Domestic Science
Supply Girls Lunch Room
Supply Teachers Room
Ground Floor Supply Manual Training Room
Supply to Boys Lunch Room
Supply to Principal's Room
2nd Floor Supply Domestic Science
Ground Floor Supply Girls Play Room
2nd Floor Supply To Class Room
1st Floor Supply To Class Room
27" x 30"
38"x18"
Volume Dampers
Mixing Dampers
Temp. Coil
23 Sections
Slide
Reheating Coils
Single Width, Single Inlet, Double Angular Discharge Fan
Direct Connected Fan-Motor
Vent from Boys Toilet
Vent from Girls Toilet

Plan of Fan Room, Ainsworth School.

first floor, and the library on the second floor; and the two toilets in the basement are warmed by direct radiation.

High pressure tubular boilers are installed and are provided with the Fess low pressure oil burning system, so that oil may be used as fuel for operating the plant without the necessity of carrying pressure on the boilers.

The entire system is designed to ventilate and heat the building to a temperature of 70 degrees F. with the outside temperature at 5 degrees above zero.

Operating Cost Heating and Ventilating Plants

By H. M. HART

IN ORDER to simplify this subject of computing the operating cost of heating and ventilating in advance of construction, we have decided to take up four different classes of buildings, namely, residences, apartment buildings, schools, and office buildings. The information at hand was so conflicting and unsatisfactory for the residences and apartments that we will be very brief in our discussion of these buildings.

Residence Heating.

Method of computing cost of operation: For this example we will take a room requiring 100 sq. ft. of direct steam radiation to maintain a temperature of 70 deg. when the outside temperature is 10 deg. blow zero.

The maximum difference in temperature is — 10 deg. to 70 deg. = 80 deg. The average difference in temperature is 35 deg. to 70 deg. = 35 deg., which, theoretically, would mean that the radiator would be in use 35/80 or 43¾ per cent of the time. Taking the heating season as seven months, or 5,040 hours, 43¾ per cent of this time would be 2,205 hours, the theoretical number of hours that radiation would be in use. The average radiator gives off approximately 225 B.t.u. per square foot per hour. Therefore, the total B.t.u. per season would be estimated as follows:

$$225 \times 100 \times 2{,}205 = 49{,}612{,}500.$$

The average B.t.u. available per pound of anthracite coal is estimated at 8,000; therefore, 49,612,500 ÷ 8,000 = 6,201 lbs. of coal, or 3.1 tons per sq. ft. of radiation.

The average indirect steam radiator gives off approximately 450 B.t.u. per square foot per hour. As it requires approximately 50 per cent more radiation for indirect heating than direct heating, this would mean that it would take $\frac{450 \times 150}{8{,}000 \times 2{,}000} \times 2{,}205 = 9.3$ tons, to heat the same room with indirect radiation.

In order to see how this checked up in actual practice, the actual fuel consumption in 10 residences was obtained from the owners, and the results are as follows:

Table of Fuel Consumption in Ten Residences.

	Bank Fires at Night	Automatic Control on Boilers	System	Sq. Ft. Direct Steam Equivalent	Sq. Ft. Indirect Steam Equivalent	Estimated Consumption in Tons	Actual Consumption in Tons
1	Yes	No	Steam	666	1,080	88	55
2	No	No	Water	1,350	1,800	148	60
3	Yes	Yes	Water	1,720	....	53½	40
4	No	No	Water	1,535	86	53	35
5	No	Yes	Water	1,340	730	86	45
6	Yes	No	Water	1,050	384	56	30
7	No	Yes	Water	1,215	312	57	40
8	Yes	Yes	Steam	1,296	384	64	45
9	No	Yes	Steam	878	2,100	157	70
10	No	Yes	Water	1,335	240	56	36

*Based on report of committee comprising H. M. Hart, chairman, N. L. Patterson and G. L. Hubbard, to Illinois Chapter at regular monthly meeting, February 10, 1913. Read at Midsummer meeting of American Society of Heating and Ventilating Engineers at Buffalo.

Of course there are various reasons for this discrepancy, but we have left these for open discussion.

Apartment Buildings.

Methods of computing costs of operation are approximately the same as those for heating residences, except that semi-bituminous coal is usually burned at a saving of about $3.50 per ton; the efficiency of such coal at $4.50 per ton being about equal to that of anthracite coal at $8.00. Thus the comparative cost of coal heating with semi-bituminous and anthracite coal for direct steam radiators is, theoretically, $24 per 100 sq. ft. per season for anthracite coal and $13.50 for semi-bituminous, such as Pocahontas. The objection to using soft coal is the increased attention required and the dirt.

The results found in actual practice were no more consistent than those found in dwellings, as will be seen by the accompanying table:

Equipment and Cost of Heating Apartment Buildings.

Building No.	Boiler	Radiation Sq. Ft.	Kind of Coal	Coal, Tons
1	2—42″ x 10′ 6″ Firebox	3,435	Pocahontas	219
2	2—36″ x 10′ 0″ Herbert	6,000	Pocahontas	334
3	1—30″ x 8′ 6″ Firebox	900	Pocahontas	36
4	2—48″ x 12′ 0″ Firebox	7,076	Pocahontas	465
5	2—48″ x 12′ 0″ Firebox	3,900	Pocahontas	190

School Buildings.

The difficulty of securing any exact figures is apparent when we take into consideration the hours which these plants operate. Again, there are vacations cutting into the period of operation. If we assume 172 days of 8 hours each with an average temperature of 38 deg. and a temperature of heated air in the chambers at 120 deg. the figures agree fairly with actual coal burned. The figures given are for an entirely different class of buildings, yet it will be seen that the quantity of coal per cubic foot of air heated per season was close. What it would do in a large number of buildings we are not prepared to say.

Spalding School: Air per hour, 1,147,440 cu. ft.; blower, 72 × 42 in.; boiler, firebox, 720 sq. ft.; amount small egg average 106 tons, at $7 per ton, per season, 0.18 lb. coal per season per foot of air warmed.

Twenty-eight room buildings, 4,162,729 cu. ft. per hour; bituminous coal, 400 tons at $2.95 per ton; 0.19 lb. coal per season per foot of air warmed.

Rosehill School—Air per hour, 800,000 cu. ft.; horsepower motor, 5; amount small egg, 73 tons at $7 per ton; 0.18 lb. coal per season per foot of air warmed.

Office Buildings.

Mr. Hubbard was asked to give a brief outline of his general practice in estimating the cost of operation of the heating apparatus in office buildings, and Mr. Hubbard has very kindly responded with the following:

"I have been asked to state how I would estimate the cost of maintenance of heating a plant from plans. From this viewpoint the statements that I make must be more

or less personal, for the premises on which I base calculations and the methods by which I arrive at the results may be widely different from those used by others. In fact, there will probably be a great difference in the results obtained by any two or more engineers, and yet the figures of cost of maintenance of plants that have come under my observation check sufficiently close to the results I have calculated that I feel justified in stating that the methods used furnished a very close approximation of what the cost will be.

"The smaller the plant the greater the cost of heating will be per square foot of radiation, largely on account of the cost of labor, but the question as to how much it will cost to keep his building heated properly is just as vital to the small owner as to the larger one, and that is one of the first questions asked of the architect.

"Assuming that the radiation shown on the plans is the correct amount for properly heating the building between the limits of outside and inside temperatures and that the ventilating equipment is also correctly proportioned, the first thing to determine is the amount of steam that will be used in producing the heat necessary to warm the building. For this it is necessary to estimate the percentage of the total radiation that will be in use continuously and the length of the heating season. For example, in the usual office building in Chicago, with direct radiation in all stories above grade and with ventilating equipment for all stories below grade, I would assume that 65 per cent of the direct radiation would be in use for the full 24 hours per day for a period of 7 months and 50 per cent of the fan coil surface for 10 hours per day for 6 months. With a condensation per square foot of direct radiation of ¼ lb. and per square foot of fan coil surface of 1½ lb., the total amount of steam required per year can readily be determined.

"Assuming that with the ordinary coal used and evaporation of 6 lb. of water per pound of coal can be obtained under all conditions of load and firing, day in and day out, the amount of coal required during the heating season can be obtained by dividing the steam used by 6. This reduced to tons and multiplied by the cost per ton (say about $2.60 under the usual conditions in Chicago), will give the cost of coal per year. Ash removals should be about 10 cents per ton of coal, and the makeup water required should be about 5 per cent of the total steam per year. The only other item to be considered is the labor, and this must be determined in each case on its own merits. There must, of course, be a man in charge, and as he will have to devote a large portion of his time to work in parts of the building outside of the boiler room, it is probably correct to charge one-third of his salary to the heating plant. In addition, there must be firemen and coal passers enough to handle the fires properly, remove ashes, and see to the normal operation of the boilers, and one or two handy men to do the odd jobs that are always requiring attention.

"The foregoing make up all the actual outlay required to produce the steam for heating but it is customary also to consider depreciation, repairs, etc., which amount to 12 per cent of the original cost of the plant.

"If the pumps required by the plant and the fans are steam-driven and the steam is turned into the heating system no special account need be taken of the amount used, but if they are motor-driven a further sum must be added to the foregoing cost: that for the electric current consumed, whether this is obtained from a plant in the building or from a central power plant."

In reference to actual practice the authors thought it might be of interest to take two different buildings of about the same type and size, one having its own power plant and the other operating a heating plant only.

Office Buildings.

In the modern office building equipped with a vacuum system, temperature control, low pressure boilers and smokeless furnaces the theoretical fuel consumption is as follows:

Direct radiation 60,850 sq. ft.

The average outside temperature for the seven heating months of 1911 and 1912 was 33.6 deg.; therefore, the theoretical number of hours that radiators would be turned on would be $70 - 33.6 = \frac{36.4}{80}$ or 45½ per cent of 210 days × 24 hr., which would be 2,293 hr. Therefore the steam required for heating would be $\frac{60{,}850 \times 225 \times 2{,}293}{961} = 32{,}668{,}091$ lb. To this should be added the loss through piping which is covered with 85 per cent magnesia, and we have estimated this to be 3 per cent of the total, which would make the total loss by radiation, 33,648,133 lb.

For ventilation there are the following units:

1 unit delivering 32,420 c.f.m. at an average rise of 26.4 deg. for 20 hr. per day.

1 unit delivering 18,400 c.f.m. at an average rise of 28.4 deg. for 20 hr. per day.

1 unit delivering 33,860 c.f.m. at an average rise of 51.4 deg. for 10 hr. per day.

1 unit delivering 19,500 c.f.m. at an average rise of 76.4 deg. for 10 hr. per day.

The steam required for above service would be as follows:

$$\frac{\text{R.} \quad \text{M.} \quad \text{HRS.} \quad \text{DA.}}{32{,}420 \times 26.4 \times 60 \times 20 \times 180} = 3{,}497{,}717 \text{ lb. of steam}$$
$$55 \times 961$$

$$\frac{18{,}400 \times 28.4 \times 60 \times 20 \times 180}{55 \times 961} = 2{,}135{,}521 \text{ lb. of steam}$$

$$\frac{33{,}860 \times 51.4 \times 60 \times 10 \times 180}{55 \times 961} = 3{,}556{,}212 \text{ lb. of steam}$$

$$\frac{19{,}500 \times 76.4 \times 60 \times 10 \times 180}{55 \times 961} = 3{,}044{,}147 \text{ lb. of steam}$$

making a total of 12,233,597 lb. of steam for ventilation, which, added to that required for heating, makes a total of 45,881,730 lb. of steam, which, when burning screenings and evaporating 6 lb. of water per pound of coal, would take 45,881,730 ÷ (6 × 2,000) = 3,823 tons.

The actual fuel consumption per month was as shown in the accompanying table.

Actual Fuel Consumption in Office Building.

	Theoretical Tons	Actual Tons	Outside Temperature, Degrees	Average Wind Velocity, Miles
October	248	301	53.3	12.8
November	542	573	35.4	16.9
December	547	468	35.0	14.4
January	783	913	11.9	14.2
February	759	656	21.8	14.4
March	640	661	28.8	13.5
April	328	286	48.8	16.5

It will be noticed from this table that, during the months of November and December, the temperature was about the same, but the wind velocity decreased

about 15 per cent and the fuel consumption about 18 per cent. The difference between the months of April and October, of course, is not consistent, but as the engineer had no means of weighing the coal as it was put into the boilers the figures given per month might not be absolutely correct.

The cost of operation of this heating plant is as follows:

Coal, 3,858 tons @ $2.37	$ 9,143.46
Removing ashes	554.00
Oil, waste, and packing	160.00
Repairs	100.00
Labor	4,500.00
Electric current for vacuum and boiler feed pumps	429.00
Water, approximately	200.00
Interest and depreciation, 10 per cent	2,892.00
	$17,978.46

making the actual cost of producing steam $\frac{1{,}000 \times \$17{,}978.46}{3{,}858 \times 6 \times 2{,}000}$

= 38.8 cents per 1,000 lb., and if the fuel for water heating were added in there would be an additional expense of $2,883 for coal and $174 for removing ashes, making the total expense per year $21,035.46. This would bring the cost of steam per 1,000 lb. down to

$\frac{1{,}000 \times 21{,}035.46}{5{,}074 \times 6 \times 2{,}000} = 34.6$ cents.

In another building, almost a duplicate, having its own electric generating plant and hydraulic elevators, the heating load would be about as follows: 68,000 sq. ft. direct radiation, at

$$\frac{68{,}000 \times 225 \times 2{,}293}{961} = 36{,}506{,}660 \text{ lb. of steam.}$$

The pipes were covered with moulded asbestos, so loss through same may be estimated at 4 per cent, which would bring this load up to 37,946,926 lb.

For heating water we may estimate the load to be about the same as in the previous building, which required 14,600,000 lb. of steam, making a total of 52,546,926 lb.

The cost of operation is as follows:

6,275 tons No. 4 washed nut @ $3.00	$18,825.00
Removing ashes	890.00
Oil, waste, and packing	470.00
Water	2,407.00
Lamp renewals	486.00
Labor	9,320.00
Interest and depreciation, 10 per cent	7,000.00
	$39,398.00

To obtain cost of steam for heating, the following deductions must be made,

For 644,742 K. W. generated:			
Fuel @ 49 lb. steam per K. W.	$ 6,551.00		
Water	249.00		
Lamps	486.00		
Ashes	310.00		
Oil, waste, and packing	100.00		
Labor	1,884.00		
Interest and depreciation	3,000.00		
	$12,580.00	$12,580.00	
For Elevators:			
Coal	$ 7,712.00		
Water	257.00		
Ashes	364.00		
Oil, waste, etc.	300.00		
Labor	2,700.00		
Interest, etc.	1,000.00	$12,333.00	$24,913.00
			$14,485.00

which would be the additional cost for heating.

If this were taken at the same cost rate as the previous building, the cost of heating would be 52,566,926 lb. of steam at 34.4 cents per 1,000 lb., or $18,083.00. Therefore, the saving on cost for heating is, $18,083

14,485

$3,598

However, this does not represent the actual saving shown by the operation of this plant. The saving would be as follows:

Cost of heating without plant	$18,083.00
Revenue for K. W. sold	25,855.00
Revenue for K. W. for public lighting	9,928.00
Cost of elevator service	12,333.00
	$66,199.00
Less cost of operation	39,398.00
Saving	$26,801.00

Ventilation.

The cost of operation of a ventilating apparatus varies greatly with the installation; but under normal conditions where the system is designed to deliver air at a temperature of 75 deg., taking outside air at an average of 35 deg., the steam required will be $\frac{1{,}000 \times 40}{55 \times 961} = 0.75$ lb. per 1,000 cu. ft.

The power will be $\frac{\text{C.F.M.} \times 9 \times \text{pressure in oz.}}{33{,}000 \times 50}$,

which for 1 oz. pres. = 0.5454 h.p. per 1,000 cu. ft.

The h.p. required varies directly with the pressure.

Hot Blast Heating.

For estimating the volume of air required the following formula is found to be quite accurate:

H = total B.t.u., to be supplied per hour.

D = difference in temperature between room and incoming air.

F = cu. ft. of air per lb. at the temperature leaving coils.

V = cu. ft. per min. required.

$$V = \frac{F\ H}{2{,}375\ D \times 60} = \frac{F\ H}{14.25\ D}$$

THERE WERE OTHERS.

The Missouri editor who apologized last week for speaking of a prominent society woman as a "colored lady," saying that he wrote it "cultured lady," should cheer up. He is not the only victim of the intelligent compositor. Here are a few amusing mistakes that have occurred recently in Missouri papers:

One editor wrote, "The young man called lustily for assistance," but it appeared in the paper, "The young man called lustily for his sisters' aunts."

Another editor ended an account of a fire with "The barn was reduced to a mass of ruins," but the compositor made it read, "The barn was reduced to mass of onions."

Still another paper in telling about a cow being cut into halves by a railroad train, gravely announced that the cow had been cut into calves. We presume that the compositor was of the opinion that as long as the word rhymed it made little difference whether it made sense or not.

But none of these is as bad as one that appeared in the New York Sun several years ago, when that paper came out with the shipping news head over the obituary of a prominent New Yorker. The head was, "Passed Through Hell Gate Yesterday."—Brookfield (Mo.) Gazette.

Questions and Answers

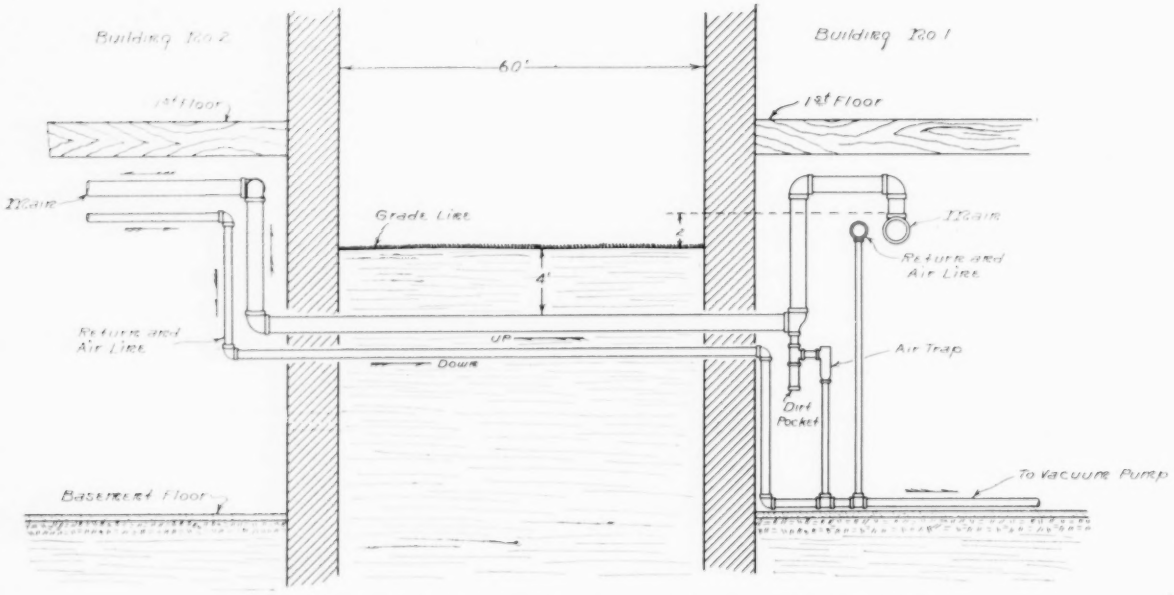
HEATING QUESTIONS FROM MONTANA.

Editor "Domestic Engineering":—Will you kindly tell me how an air line should be run and where it should be connected to a vacuum steam heating system? What size electrical vacuum pump will be needed on a system with 3,600 sq. ft. radiation?

Two buildings are located on the same level and 60 feet apart, and they are to be heated from the same steam main. This steam main runs about two feet above grade level in the first building it enters. The question is this: How can the second building be heated from the same main, and how can the main be run four feet under the surface? Both buildings have deep basements. How should the return from the second building be run?

Big Timber, Mont. L. O. C.

The air line of a vacuum system should be run around the basement of the building suspended from the ceiling of the basement on a parallel with or just below the level of the heating main. Circumstances and the character of the system installed govern this to a certain extent. If the air line acts in the dual capacity of an air and return line it should if possible be installed in such a manner that the water will return by gravity to the pump or receiver. If this method can be followed it will lighten the work of the pump. An electrical vacuum pump requires a much larger cylinder than a steam vacuum pump for the same work, and the size of the electrical pump will depend upon the character of the installation. We advise correspondent to place all of the facts regarding the work and the system to be employed before any of the manufacturers of vacuum pumps (advertised in "Domestic Engineering"), and they will recommend a pump for the work. The second question presents a problem which is not difficult to solve if we have a correct understanding of the conditions of the work. The steam can be piped to building No. 2 exactly the same as for an ordinary gravity job. The steam connection should be taken from the main in building No. 1 and carried to point where drop is made for underground connection to building No. 2. Swing joints should be employed in making this connection, and the main should have a slight upward pitch towards building No. 2. If this main is run in a trench or boxing, the air and return line may occupy the same trench or box, and the pitch of this pipe should correspond with that of the main. The bottom of the loop connection in the basement of building No. 1 should be provided with a dirt pocket and air trap and should be connected to pipe leading to the vacuum pump.



Sketch Showing Method of Connecting Main and Return for Detached Building.

If sufficient vacuum is carried on the system to lift the water of condensation to the level of the return and air line in building No. 1 the return coming back from building No. 2 and the drip from bottom of the loop may rise and connect into the air and return line on a level with the main in building No. 1. We offer a sketch showing in principle the method to be employed in connecting the main and return for the detached building.

A CHIMNEY-FLUE PROBLEM.

Editor "Domestic Engineering":—I am to install a steam boiler, with a capacity of 3,000 sq. ft., in a three-story brick building. This building was formerly heated by a hot-air furnace, when it was only two stories high. This hot-air furnace was connected to a chimney, 9x12 inches, and right next to this chimney, with only a course of brick between, runs another flue which carried the hot air to the second floor. When the third floor was added this chimney and flue were both extended to the top of the building with the idea that both should be used as chimney for the 3,000 ft. boiler.

Some heating men here are of the opinion that it will

not work unless the brick-wall between the two flues is cut out from the top to the bottom. Others think that it will work if the partition is cut out 6 inches from the top, while still others hold that a Y smoke pipe with a branch to each flue will work satisfactorily. My own idea is to cut the wall out between the two flues at the bottom and insert the smoke pipe in the center of the chimney.

How would you solve this problem?

Pittston, Pa. J. S. A.

In reply to the above inquiry would advise correspondent that it is not necessary to cut out the entire partition between the two flues. Smoke ascends a chimney flue spirally and is easily choked at the point where the smoke pipe is connected to it, and for this reason proper flue area is required at this point; in this case there is sufficient area available provided both of the flues are used.

Cut out the dividing wall at the bottom for a distance of six or eight feet above the smoke pipe hole and should the boiler require a 12-inch smoke pipe gradually increase the size of it between the boiler and the chimney and enter the chimney with the pipe about 15 inches in diameter, or, if the boiler requires a 15-inch smoke pipe, increase this size to 18 inches at the chimney.

If the chimney is carried well above the roof it will be unnecessary to cut out the dividing wall between two flues at the top of it. The principle of employing a Y smoke connection for connecting a single smoke pipe to two flues has been employed repeatedly with good success where there is sufficient area in each flue to allow of an increase of twenty to twenty-five per cent in the area of the smoke pipe.

In the present case each Y branch could not be more than 9 inches in diameter and the combined area of two 9 inch pipes is 127,234. If the boiler requires a 12-inch pipe the area of it is 113,098 and the two 9-inch Y branches might be sufficient. If, however, the boiler called for a 15-inch smoke pipe (area 176,715) the 9-inch Y branches will prove insufficient in area.

THIS WORK SHOULD BE TESTED.

Editor "Domestic Engineering":—Plumbing tests, both water and peppermint, are required in residences, but in an outhouse, fifteen feet from the main building, no test of any kind is made other than an inspection by the eye. Leaky joints will most likely be passed in this way as well as cracked pipe and fittings. This is not only insanitary and dangerous, but it seems also an injustice to the property owner, who is to pay for the time it takes to prepare a job for a test. What is your opinion about this matter?

New Orleans, La. G. T. W.

We agree with correspondent in what he has to say concerning the testing of plumbing in this outhouse.

Of course there is not so much danger to inmates from defective plumbing in an outhouse as in the main building, where they live and eat and sleep. Nevertheless we feel that the outhouse plumbing should be thoroughly tested, for the reasons given by correspondent. It seems to us that the very fact that this part of the work was not to be tested, would be an invitation to a certain class of plumbers, to put in cheap and defective material, with very little care given to its proper and workmanlike installation.

Mount Vernon, N. Y.—Thomas Orion, plumbing contractor, at South Seventh Avenue and Third Street, is building a residence for himself on Westchester Avenue, Chester Hill, in this city.

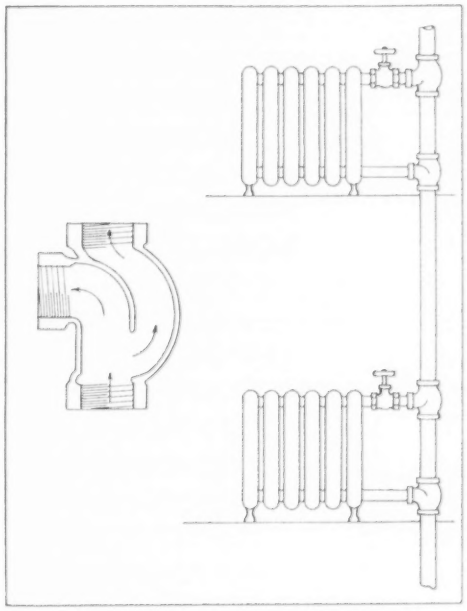
THE "O. S." DISTRIBUTING FITTING.

Editor "Domestic Engineering":—Will you kindly explain what an "O. S." distributing fitting is, and what advantages it has?

Montreal, Canada. D. E. S.

The "O. S." distributing fitting we show in section, and also in use on radiator connections, flow and return, in the accompanying illustration.

The great advantage of these fittings is that they very



The "O. S." Distributing Fitting.

largely reduce loss from friction, and also are of material benefit in quickening the circulation.

A further advantage in their use, is the saving in labor that is gained.

COMMENTS ON FIGURING RADIATION FOR STEAM HEATING SYSTEMS.

Editor "Domestic Engineering":—In "Questions and Answers" of the October 11th issue of your journal, there is a question from J. C., of New Castle, Pa., which you evidently answered without very much examination. I assume that J. C. really desires information as he very plaintively says, after making his statement in regard to his four authorities: "When the doctors disagree where does the poor fellow come in at? Please give some information on this point."

You very properly gave him some suggestions in regard to the special job he had been trying to figure, but with your permission I would like to add some comment to what has been said.

He names only two of his authorities, Mills and Carpenter. Therefore it will be only these two that I wish to discuss with J. C. and your other readers.

To begin with, J. C. makes some errors in handling Mills' rule figures, as indicated by you in your reply to him. In the next place he makes startling errors in his attempted use of Carpenter's rule.

The Mills' rule is the most abused rule in the heating

business. It was not devised to apply to any system except Mills' patented overhead system, in which a very high velocity of steam could be secured. It so happens that by using larger pipes than Mills advocated that the rule works with a fair degree of accuracy under any method of piping which will not require more than about five pounds pressure to secure sufficient velocity and volume of steam to supply the radiators with the heat units needed to give off 240 B. t. u. per square foot of radiator surface.

Mills fixed the pressure at five pounds at the radiator, which was very low for the period, 1890, when Mills' system was made generally known by the publication of his first book.

It will be well now to compare what the two authorities, mentioned by name by J. C., say in regard to the question of heating buildings.

Mills on page 478 of his book says: "In determining the amount of radiating surface necessary to properly warm a room, the *cubical contents* of the room play a small part, as compared to the exposure of the building, as represented by the amount of outside *wall* and the *glass* in the windows, that by its material and *thinness* is continually dispersing heat, and finally, the mode of ventilation, or the conveyance of heat from the room by currents of air."

Prof. Carpenter says on page 64 of the 5th edition of "The Heating of Buildings" under the heading, "Loss of Heat from Buildings": "Heat is required to supply the loss due to radiation and conduction of heat from windows and walls, and to warm the air required for ventilation. The amount of heat required for these various purposes will depend largely upon the construction of the building and the air needed for ventilating purposes."

Mills says: "To provide for these losses, and at the same time to make some allowance for the contents of the room, an addition is made to the heating surface of an amount sufficient to raise the temperature of all the air in the room *once every hour* from an outside temperature of 32 degrees to the standard inside temperature of 70 degrees."

Prof. Capenter says: "The air required for ventilation will vary with the conditions: but in direct heating it seems necessary to allow for *three* changes per hour in halls (of houses), *two on rooms on first floor,* and *one* in rooms on upper floors." (The italics are mine.)

Mills makes but few definite exceptions for use with his so-called 2-20-200 rule, but made one of great importance which seems to have been totally forgotten. It was this: "The cooling effect of the exposed surface of the walls of a building will *vary considerably* with the *material* and its *thickness.*" When lathed and plastered on the inside it may be assumed roughly to be one-tenth that due to the same area of glass. But for variation from this specified condition of wall he made many arbitrary additions, or deductions.

Now J. C. calmly uses the Mills rule with its allowance of *one* change of air per hour per room from 32 degrees to 70 inside, and then proceeds to apply Carpenter's rule for changing the entire contents of the rooms *three* times per hour from zero outside to 70 degrees inside, and then wonders, "where does the poor fellow come in at?"

He does another thing equally strange. He does not even seem to think that Mills is working on the basis of a steam temperature of 228 degrees, or 5 lbs., while Prof. Carpenter says distinctly of his rule, "that if we are to heat to 70 degrees in zero weather with *steam at ten pounds pressure, multiply by ¼.*" (The italics are mine.)

If J. C. should apply Carpenter's rule as it should be, to this especial case, and then bring his surface to the same temperature called for by the Mills rule he will find but a very slight difference in them for this one job. But the Mills rule is far less accurate for all sorts of conditions than several of the more recent rules.

If J. C. and others will get at the truth of the Mills rule they will find that he personally used a unit rule from which he made what he called a "general rule applicable where the climate is similar to that of the larger cities of the Northern States."

If J. C. will only learn that each rule may, and probably does, have its foundation upon a boiler pressure a little different from the other fellow's rule, and learn how to find out what that foundation pressure is, and also learn that the speed with which the rule may require the steam to be delivered to the radiator is probably different as well, and that this may have a bearing on the size of main that he will need in order that the rule, if used, shall not disappoint him in the results obtained, he will be in a fair way to become a first class steam fitter. He will also have a very definite idea of where he "is at" whatever rule he attempts to use.

Belfast, Me. Student.

FRICTION OF WATER IN PIPES.

Editor "Domestic Engineering":—Kindly let me know what causes or conditions determine the amount of friction of water in pipes. I would especially like to know whether pressure increases friction or not.

Spokane, Wash. Journeyman.

In answer to "Journeyman's" inquiry, we give the following:

Friction does not depend in any way on the pressure of the water on the surface over which it is flowing.

Friction of water is proportional to the area of the surface over which it flows, and increases with the roughness of the surface. At a low velocity (not more than one inch per second) friction increases with the velocity.

Friction of water in small pipes is greater comparatively than in large pipes, for the reason that a greater proportion of the water comes in contact with the surface of the pipe in the case of small pipes.

CONTAINED SOMETHING HE WANTED TO KNOW.

Greensburg, Ind., Oct. 14, 1913.

Editor "Domestic Engineering":—Enclosed please find check for $2.00 in payment for subscription for one year. I think you will find there is no exchange on this check. If there is, I will send you 10c postage. Am pleased with the paper, the very first copy had something I wanted very much to know, and that was a system of accounting for the little fellow. Your system of checking on a job was my system exactly, but I have not followed it up far enough.

Thanking you, I am, yours very truly,

James A. Eaton.

DOES NOT WANT TO MISS A SINGLE NUMBER.

Rockford, Ill., October 17, 1913.

Editor "Domestic Engineering":—I am jealous to lose one number. I have not received No. 2, Vol. 65, 10-11-13. Please send me that number and oblige yours truly. Beats H—— how business keeps up!

C. W. Barber.

The Plumbing School at Carnegie "Tech."

Some Interesting Facts Concerning the Education of the Younger Generation in Practical Plumbing Practice at a Modern School

IN the School of Applied Sciences, of Carnegie Institute of Technology, at Pittsburgh, Pa., especial attention is being given this year to the plumbing and sanitary courses. It is openly declared that these two departments of "Carnegie Tech" have been among the most popular in all of the group schools, and that the enrollment this season far exceeds that of any previous term.

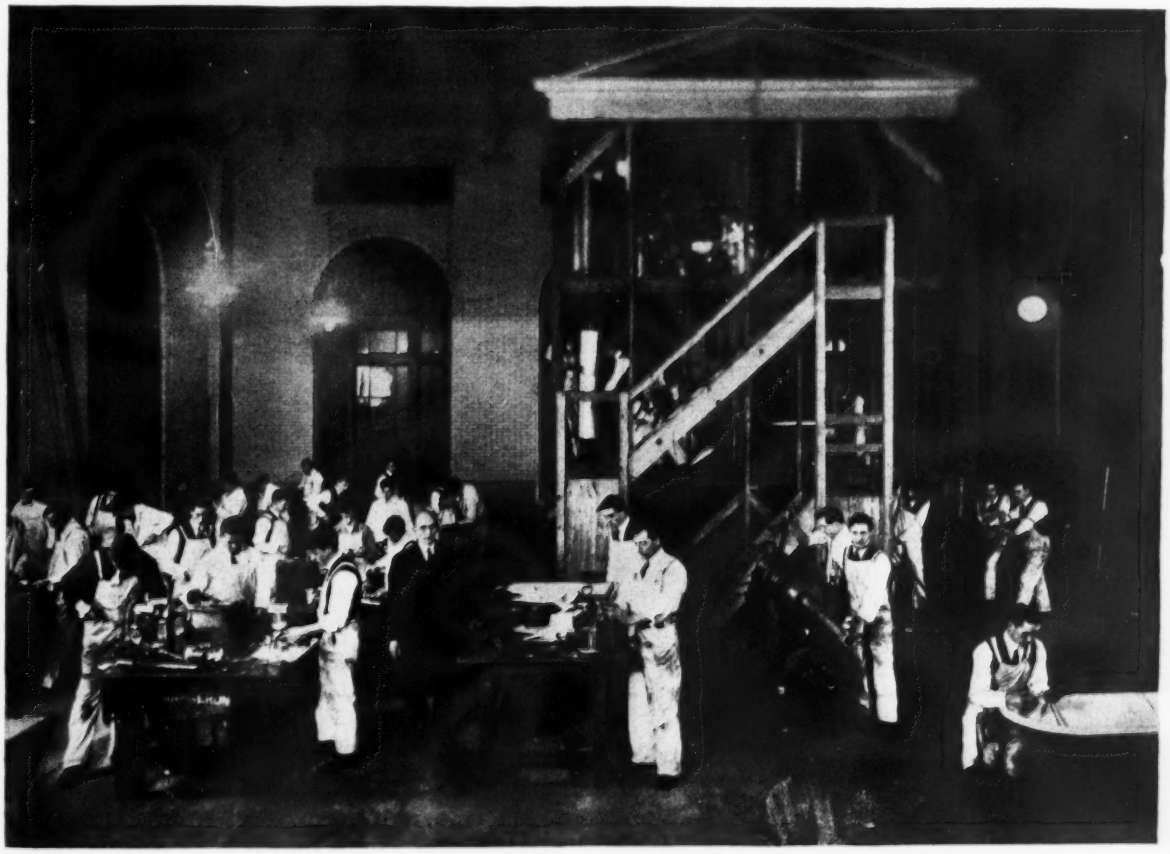
Instruction in plumbing at this school, which is the largest plumbing school in the world, falls into three groups. In the three year day course in building construction, the subject of sanitary equipment and installation (plumbing) is one of the specialized courses, while all who take this course feel duty bound to delve into the plumbing feature.

In group "2" is offered a one-year intensive trade course in plumbing to mature applicants who have had practical experience and training in this branch. This indicates that the apprentice plumber, while continuing work at his trade in the day time, can in the evenings partake of the instruction in this particular department, thus helping himself to a greater degree of efficiency and increasing his earning capacity. Many apprentice plumbers in the Pittsburgh district are now enrolled in the night classes, and continue their regular routine employment in the daytime.

In the night course, however, the course in plumbing requires the satisfactory completion of four years of night work for a certificate of graduation. Although a great many men withdraw from the classes and do graduate they at the same time have received the volume of instruction they believe they require for their immediate purposes.

The plumbing shop at Carnegie "Tech" is equipped with twelve work benches and forty-eight gas-heated soldering pots. The benches are fitted with tool boxes, each student being supplied with a kit of tools. These benches are used for lead work, joint wiping and for general purposes. There are also three vise benches equipped with vises and necessary pipe clamps for pipe fitting. At the same time the shop is replete with all the latest improved hand tools, such as stocks and dies, chain-tongs, pipe wrenches, ratchet-reamers and with a large pipe machine.

In this shop is also a large pipe machine, which is declared to be one of the largest and most improved ever installed in a technical school.



Model Skeleton Residence at Plumbing School of the Carnegie Institute of Technology, Pittsburgh, Pa., Showing Hot Water Boiler, Kitchen Sink and Bathroom Installation.

There has also been erected in the school workroom a model building, in which a complete job of residence plumbing is installed, including a bath room and kitchen plumbing, with all the necessary drains and vents. There has also been erected a skeleton model of the modern skyscraper type, in which the Durham system is demonstrated, together with the various systems of water supplies.

The shop is equipped with a testing trough which is fitted with various types of glass traps, glass closet bowls of different kinds and gauges. These traps and bowls are used for demonstration purposes, showing the advancement in the design of plumbing fixtures, as well as the syphonic action under actual working conditions. By these methods practice is more generally followed than theory.

These school rooms are well lighted, and are on the ground floor, this floor being constructed of concrete.

In our issue of last week was shown the workshop with the skeleton building, and on page 139 is shown that portion of the shop in which the sample heating and ventilating is also specialized in the plumbing courses, and students in the electric wiring and telephone departments also receive part instruction in the plumbing department, where the necessary instruction and practice in soldering and joint wiping enable them to make joints and branches in lead sheathed cables.

In the course of installing dwelling house equipment in the model building, the student must first design and estimate the work. After roughing-in is completed, the water is applied, then the fixtures are installed. After this is done, the traps are sealed, the vent pipes on the roof are plugged, a syphon gauge is connected to the fresh air inlet, and then the air test is applied, showing actual seal of the traps.

One of the salient features of this study is a series of lectures on the science of the trade. These lay special stress upon hospital work, dealing with the best methods and latest devices, and the process of lead burning or chemical plumbing. The lecturer always explains in minute detail the requirements, and illustrates his subjects with many drawings. Many of these diagrams of defective plumbing illustrate the work that has been done by incompetent workmen.

Crystal Falls, Mich.—Joseph Brooks has secured the contract for the installation of a steam heating plant in the Diamond Drill Building.

Grand Rapids, Mich.—R. A. Stonehouse & Co. have secured the contract for the plumbing in the McMullen residence on Morris Avenue, S. E.

Taylorville, Ill.—Powell & Son have secured the contract for the installation of plumbing and heating systems in the new Presbyterian church.

Duluth, Minn.—The D. R. Black Co. has secured the contract for the plumbing and heating in the new armory at Pine City, Minn. Consideration, $2,800.

Eagle Grove, Iowa.—Odgers & Shirer have been awarded the contract for the installation of an up-to-date plumbing system in C. J. Morse's new residence at Belmond.

Eagle Grove, Iowa.—The Roper Hardware Co. has secured the contract for the installation of an up-to-date plumbing system in the new opera house in this city.

Portland, Ore.—Williams & Beggs Co., 386 Flanders Street, have been awarded the contract for installing plumbing in the warehouse of the Capital Oil Refining Co.

Edwardsville, Ill.—The M. Desmond Mfg. Co. has secured the contract for the installation of plumbing and heating systems in the new building of the Edwardsville Bank.

Mount Vernon, N. Y.—Sillery & Casey, of 37½ South Third Avenue, have been awarded the contracts for the installation of heating systems in several large residences in this city.

Ottawa, Kans.—The Elder Mercantile Co. has been awarded the contract for the plumbing and heating in the new Dobson building. The contract amounts to about $7,000.

New York, N. Y.—C. E. Hoyt, of 156th Street and Forest Avenue, has secured the contracts for installing plumbing systems in two loft buildings at Tenth Street and Second Avenue.

Lancaster, Pa.—Everts & Overdeer have been awarded the contract for the installation of heating and ventilating systems in the State Sanitarium at Hamburg, Pa. Consideration, $82,000.

Philadelphia, Pa.—W. Y. Hetzel Co. has secured the contract for the installation of a new heating system in the Church of the Nativity on the corner of Seventeenth and Tioga Streets. Consideration, $1,865.

New York, N. Y.—The Raisler Heating Co., of 66th Street and Broadway, has secured the contracts for the stallation of plumbing systems in eight large apartment buildings on Barrett Street and Southern Boulevard.

Rome, Ga.—The Roser Plumbing Co., of 10 Third Avenue, has secured the contracts for the plumbing in the Georgia State School of the Deaf and Dumb at Cave Springs and in Dr. Wm. Winston's residence in this city.

New York, N. Y.—Rubin & Marcus, of 1480 Washington Avenue, have been awarded the contracts for the installation of plumbing systems in eight large apartment buildings now under construction on Southern Boulevard.

Hastings, Neb.—H. H. Lembke has been awarded the contract for the plumbing in Ephraim Dreitzler's new residence at Twelfth Street and Kansas Avenue. He also has secured the contract for remodeling the plumbing in the city jail.

Grand Rapids, Mich.—The Weatherly Co., of Campau Avenue and Pearl Street, has just secured the following contracts: Plumbing and heating the Keeler Building on Division Avenue, the Citizens' Telephone Building at the North End and the Alaska Fur Co.'s building on Monroe Avenue.

Spokane, Wash.—The James Smyth Plumbing Co. has secured the contract for the plumbing and heating in the terminal station of the Oregon-Washington Railroad & Navigation Co. and the Chicago, Milwaukee & St. Paul Railway Co., which is to be built in this city. The contract amounts to $40,000.

Fort Wayne, Ind.—Derheimer Bros., of 523 East Jefferson Street, have secured the following contracts: Plumbing the new hospital building at the Indiana School for Feeble Minded Youth, consideration $8,000; plumbing and heating the residences of Judge Eggeman, Mr. Berghoff, Mr. Mahwin and Roger Fisher; heating the residences of George DeWald and Mrs. Samuel Chaskae. Some of these residence contracts run as high as $3,000.

New Business Ventures

Webster City, Ia.—Frank Wetkovska has opened a plumbing establishment in the Martin Building on Second Street.

New York, N. Y.—James Wares has opened an up-to-date plumbing and heating establishment at 276 East 143rd Street.

Westerly, R. I.—Carl Scholfield and Charles H. Vinal are considering the establishment of a plumbing business at Guilford, the latter's home town.

Cody, Wyo.—J. Y. Smith and T. W. Kurtz have formed a partnership under the firm name of Smith & Kurtz, and have opened an up-to-date plumbing establishment in this town.

Chicago, Ill.—H. H. Mitchell, of 347 East 43rd Street, has just opened a plumbing, heating and hardware business at 3173-75 North Clark Street, under the name of the Chicago Hardware & Plumbing Co.

Pueblo, Colo.—The Independent Plumbing & Heating Co., of this city, has been incorporated with a capital of $10,000. The incorporators are: J. E. Tully, A. F. Cherry, P. C. Dunlap, W. S. Marble and H. C. Smith.

Galva, Ill.—Thomas Coleman, who conducts an up-to-date plumbing and heating establishment in this city, has just opened a branch establishment in the Kewanee Star Courier Building at Kewanee, Ill., where he has many friends, owing to the fact he was connected with the Kewanee Sanitary Supply Co. for ten years, previous to his engagement in business on his own account.

Business Changes

Kearney, Neb.—Charles P. Lucas has purchased the plumbing business of Plummer Bros. in this city.

New York, N. Y.—J. Shauski has moved his plumbing establishment from Jennings Street and Southern Boulevard to 1083 Tremont Avenue.

Cameron, Mo.—Edward Duncan has purchased the plumbing business of I. W. Hendricks. The establishment will be moved to the Calder block.

Amherst, Mass.—A. M. Woodward has bought out the plumbing business of Allen, Woodward & Co., and will continue it under the name of Woodward & Co.

Edgar, Neb.—W. G. Herrick, formerly of Corning, Ia., has opened a plumbing establishment in this town. Edgar has 1,100 inhabitants and Mr. Herrick has the only business of his kind in the town.

Lake Geneva, Wis.—Grant R. Searles has closed out his plumbing business at South Haven, Mich., and has taken over the business of C. E. Frederick here. He was formerly of Ronk & Searles, Delavan, Wis.

Mount Vernon, N. Y.—Joseph Gleacher has moved his plumbing and heating business from North Fifth and Stevens Avenues to 115 North Fifth Avenue. He has just secured the contract to install the plumbing in the new Schleicker Building. Consideration, $2,100.

Obituary

Lorenz Sticht.

Lorenz Sticht, who was for many years engaged in the plumbing business in Buffalo, N. Y., died at his home in that city on Tuesday, October 21st after a brief illness. He was prominent in German Lutheran church circles and was for several years treasurer of the Teutonia Liederkranz. His widow, a son and a daughter survive.

S. J. Wirtz.

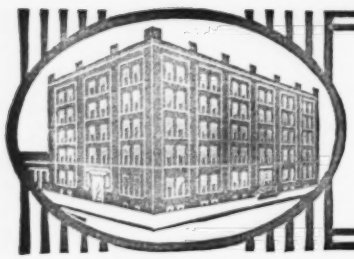
S. J. Wirtz, one of the pioneer master plumbers of Jackson, Mich., died at his home in that city on Thursday evening, October 23rd, from concussion of the brain and internal injuries, received in a fall from an apple tree, on Monday afternoon, October 20th. Mr. Wirtz was in his 71st year, but was in quite robust health until he met with this fatal accident. He had been engaged in the plumbing business in Jackson for more than thirty years, and was plumbing inspector from 1903 to 1910. He was considered one of the best plumbers in his city and he had many friends who regret his sudden death.

Ezekiel Mills, Jr.

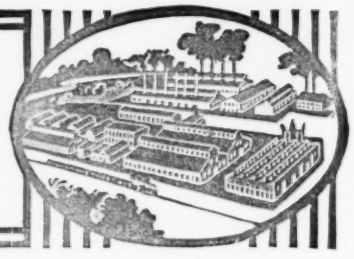
Ezekiel Mills, jr., for forty years engaged in the plumbing business, at Baltimore, Md., died at his home in that city on Saturday, October 18th, of a complication of diseases, from which he had suffered for the past six years. He would have been sixty-seven years old had he lived to October 24th. Mr. Mills was born at Ellicott City, but moved to Baltimore fifty years ago. He went into business on his own account in 1873. One of his most important pieces of work was the installation of the plumbing in the Baltimore City Hall, and for years he had maintained the plumbing in the public schools. He is survived by his wife, two daughters, three brothers and two sisters. A son-in-law, James I. North, has been a partner in the Mills business for a number of years.

Col. James J. Smith.

Col. James J. Smith, one of the oldest master plumbers of Cleveland, O., died at his home in that city on Tuesday, October 7th, in his 72nd year. Col. Smith enlisted in the 69th Regiment of the New York Volunteers, at the outbreak of the Civil War and participated in fifty-two battles and engagements, among them the battle of Gettysburg. He received severe wounds and displayed such bravery and efficiency that he returned to New York as lieutenant-colonel. Coming to Cleveland soon after the close of the war, he engaged in the plumbing business, in which he, as a practical and theoretical exponent, had few equals and still fewer superiors. Recognized as an expert by the city of Cleveland, he served for many years as a member of the Board of Health. His services were sought, and given freely, concerning the construction of many of the city's most prominent buildings, and his business competitors and his employes have through all the long years of his business career, held him in sincere esteem. The Cleveland Master Plumbers' Association passed resolutions on his death, expressing in a touching manner the loss every member feels in the demise of one of their most beloved fellow members.



Among the Wholesalers and Manufacturers



WILL MAKE HEATING BOILERS.

The Cuyahoga Boiler Works Co., of Cleveland, O., has been incorporated with a capital stock of $30,000 to manufacture house-heating boilers. The incorporators are: John Maher, sr., John M. Maher, Wiliam H. Batten, Henry W. Batten and M. M. Teidner.

THE MONARCH VALVE CO. OPENS OFFICE IN PITTSBURGH.

The Monarch Valve Co., with general offices in New York City and factory at Warren, Mass., has opened a branch office at Pittsburgh, Pa., under the management of Edgar M. Moore & Co., who are located in the Farmers' Bank Building.

DECLARED REGULAR QUARTERLY DIVIDEND.

W. A. Myler, secretary and treasurer of the Standard Sanitary Manufacturing Co., of Pittsburgh, Pa., announces that the board of directors at its meeting last week declared a quarterly dividend of one and three-quarters per cent on the preferred stock and one and one-half per cent on the common stock. The dividend checks were mailed forthwith to the stockholders.

EASTERN SUPPLY ASSOCIATION TO HONOR P. M. BEECHER.

In compliance with a resolution passed at the recent annual meeting of the Eastern Supply Association to present its retiring president, P. M. Beecher, of Syracuse, N. Y., with a suitable token as a remembrance of its appreciation of his services during the five years he was its president, President L. O. Koven has just appointed a committee to purchase such a gift, the committee consisting of the following gentlemen: D. L. Hamill, of Buffalo, N. Y.; Joseph F. Evans, of Wilkes-Barre, Pa.; and John A. Murray, of New York, N. Y.

SEATTLE MANUFACTURERS EXPAND.

A new phase of the confidence prevalent in the great northwest as to the future developments of that section is manifest in a recent move of the Louis Burton Company, Inc., Seattle, Wash. This company is proceeding with the erection of a manufacturing plant of their own on Harbor Island, in Elliott Bay, just adjacent to the Seattle water front. In this plant they expect to manufacture all the articles which they have formerly made in rented spaces in the city of Seattle and to prepare themselves for the coming of considerable developments at the time of the opening of the Panama Canal.

The line of manufacture covered by this company includes turbine fans, which are of a multi-blade type, used for heating and ventilating buildings; air washers and humidifiers used in public buildings; thermostatic systems, and Cromwell motor valves.

This company has operated for several years in the northwest and has supplied a great number of buildings with their equipment, including among other things the Providence Hospital, Franklin High School, Lincoln High School, as well as a number of grade schools in Seattle; the Multnomah and Carleton Hotels, as well as a number of other buildings in Portland; and in Vancouver, B. C., the King Edward and Britania High Schools, the World Building—the tallest in the British empire, as well as a number of other buildings.

The firm reports a number of contracts at the present time, consisting principally of schools, on some of which, for instance, the Bryant and Concord schools, in Seattle, the firm is supplying the fans, engines, air washers, heating coils, vacuum system and thermostats. They also report considerable activity in mine fan sales in Alaska, which fans are being shipped out quite regularly by this company.

It is expected that with the opening of the Panama Canal a considerable readjustment of railroad rates will be in order and this adjustment of rates is going to be the only limiting factor of the territory supplied by this company east of the coast.

The proposed building will at present be 150 feet long by 60 feet wide and an average of 30 feet high, to be one story, of heavy mill construction, with 3-in. flooring carried on concrete stringers. It will have a dormer roof and will be strictly of the daylight variety, practically half of the wall surface being composed of windows. This comprises the first of three units of equal size. There will be a crane runaway through the middle 20 feet wide, extending the full distance and the machine shop, which is now located on the ground floor, will ultimately be swung into a balcony at the side of the building and extending the full length, thus leaving the whole floor for erection purposes.

OCTOBER MEETING OF NEW YORK CHAPTER, AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS.

Half of the membership attended the annual meeting of the New York Chapter of the American Society of Heating and Ventilating Engineers at 29 West Thirty-ninth street, New York City, on Monday evening, October 20. President Frank G. McCann opened the meeting with a statement that the accomplishments of the year would be recapitulated in the secretary's report.

Secretary Joseph Graham reported that the chapter had 78 members and gave a review of the work of the year. He stated that three members had been lost through death, Dr. John S. Billings, N. P. Andrews and John S. Payne. He recounted the service rendered the Society through a committee from the chapter taking charge of

Some of the Members of the Western Trade Golf Association. From Left to Right, E. Buehler, J. F. Tuttle, L. C. Huckins, Paul Blatchford, C. D. Little (in Two Poses), W. B. Dale, D. E. McCabe and W. A. Cameron.

the arrangements for the annual dinner of the Society and carrying it through to a gratifying success.

The success of the chapter dinner attended by 148 members and guests was commented on in a very entertaining account. He then reported that during the year $450.25 had been collected and $314.77 had been expended, leaving a balance of $135.48, and that delinquent members owed $60.

Treasurer Arthur Ritter reported that there was a balance in his hands of $125.48.

James A. Donnelly, in the absence of Ralph C. Taggart, chairman of the Committee on Fees, read his report and also reported the work of the Committee on Tests. Frank T. Chapman reported progress for the Committee on Moving Picture Theater Ventilation.

Frank K. Chew and Homer Addams, the tellers, reported the election of the following officers:

President, D. D. Kimball.

Vice-President, Arthur Ritter.

Secretary, W. T. Goodnow.

Treasurer, Arthur Ritter.

Board of Governors: Frank G. McCann, W. S. Timmis and W. H. Driscoll.

Mr. Chew then on behalf of the members of the chapter paid a tribute to the retiring secretary, Joseph Graham, and presented him with gold bar cuff buttons, a moonstone scarf-pin and a double eagle as evidence of the appreciation of the work he had done in carrying the chapter through its first two years. Mr. Graham thanked the members for their kindness in a brief speech.

By a unanimous vote action was taken on amendments to the constitution which will be submitted to the members for a mail vote, changing the annual meeting to April, authorizing the Board of Governors to pay a salary to the secretary, providing for the placing of two names in nomination for each office and giving delinquent members a year before their names are dropped.

James A. Donnelly made a motion that was carried to appoint a committee to consider the establishment of a junior course of instruction for young men in the field. On the motion of Frank K. Chew the appointment of a committee was made to invite the men identified with the vacuum heating industry to join the chapter in making the meeting of November 17 notable for the presentation of information on vacuum heating.

SOME REMINDERS OF THE WESTERN TRADE GOLF MEET.

It is our pleasure to show on this page some pictures taken by the "Domestic Engineering" representative at the tournament of the Western Trade Golf Association, held at Calumet Country Club, October 23. These gentlemen will be easily recognized as some golf players—they admit it themselves. Inclement weather cut down the expected attendance, but those who braved the chilly wind were amply repaid for the effort.

WILL MANUFACTURE PLUMBING SPECIALTIES.

The Paul Ayres Co., of 317 Sixth Street, Brooklyn, N. Y., has been incorporated with a capital of $10,000 to manufacture plumbing specialties. The incorporators are: Paul Ayres, Harvey S. Van Duyne and C. T. Rocks.

The Kenny Valve & Supply Co., of New York City, has been incorporated with a capital of $25,000, to manufacture plumbing specialties. The incorporators are: J. C. Mayer, of Brooklyn; J. McQuade, of Newark, N. J.; F. C. Hirleman, of New York City.

THE NEW TARIFF AND THE SANITARY POTTERY INDUSTRY.

The new tariff act has at last been passed, but the actual effect on the domentic sanitary pottery manufacturers will probably not be felt for some time to come. The progress made by the American potteries during the past ten years in the perfecting of their body and designs has been such that it is logical to suppose that the trade built up along these lines, added to the friendship gained, will not be broken off in any abrupt manner, says "The Anchor," published by the Thomas Maddock's Sons Co., of Trenton, N. J.

The new tariff as embodied in schedule "B," reduces the import duty on earthenware (opaque Porcelain) white, from fifty-five to thirty-five per cent, and the question now to be decided is to what extenet will this reduction attract foreign competitors.

There is no other American industry in which labor has shared with the manufacturer the results afforded by tariff protection to such an extent as the potter, and

First Group, W. A. Cameron, D. E. McCabe, E. Buehler and J. F. Tuttle. Second Group, J. P. Dugger, H. E. Keeler, J. M. Stannard and F. Van Inwagen. Third Group, W. B. Dale, Paul Blatchford, L. C. Huckins and C. D. Little.

under these conditions it is safe to assume that they will again work hand in hand if the reduction proves unsatisfactory.

The pottery industry is peculiar in so far that it is not susceptible to the highly improved machinery of today, nor is the business of any one particular plant of such volume as to warrant great savings in scientific management—these facts, combined with the demands in our country for a highly vitreous body, and the loss occasioned in producing it, and the keen competition in the selling market, have all tended to reduce the financial returns to the manufacturer.

The pottery industry in America is one that has struggled along in a brave manner, and the men at the helms of the various firms have proven their willingness to unite with the workmen for the common good of all concerned, and when it is considered that the financial returns are not as good as if the same capital were invested in some other branch of trade, it seems that the good will and confidence of the American public should at such a time show its loyalty.

THE ANNUAL DINNER OF THE UNITED BUNCH OF SHEEP IN NEW YORK CITY.

The accompanying picture is a reproduction of a photograph of the New York Fold of the "United Bunch of Sheep," taken at their recent annual dinner in New York City, which was reported in this column recently.

The Annual Dinner of the "United Bunch of Sheep" in New York City.

Personal Mention

Frank B. Howell, assistant general manager of sales, of the American Radiator Co., will hereafter make his headquarters in Buffalo, N. Y., in order to give more of his attention to his company's Institute of Thermal Research, with which he has been closely identified since its inception.

Harold B. Beard, senior partner of the firm of Beard & Beard, heating engineers and jobbers of heating supplies, of Reading, Pa., was united in marriage to Miss Estella L. High, on October 16th. The wedding took place at the home of the bride in Reading. After a dinner and reception Mr. and Mrs. Beard departed on their wedding journey through New York and Michigan.

A WHITE HOPE AND THE OTHER FELLOW.

It might not take a great deal of imagination to conjure up that jovial gentleman of the snow-white name, Mr. Harry Snow of the Peerless Selling Co., as the "White Hope." Sometimes it might require a little training to get him in shape for the next fracas, but Harry's jovial disposition would tend towards putting him right.

Col. Stinson and Jovial Harry Snow, of the Peerless Selling Co., Taken at Chicago South Side Picnic.

The photograph herewith was taken at the outing of the Chicago South Side Master Plumbers last summer. The gentleman at Mr. Snow's right is Colonel Stinson, one of Chicago's sewer contractors. The feature of the picture is the fact that the picture was taken by Mr. Frank Pearson and was developed in Sweden by the King's photographer, in Stockholm. The lady who carried the roll all that distance finally returned a print from the film to Mr. Snow.

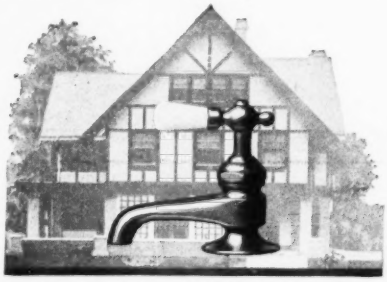
HAWS SANITARY DRINKING FAUCET.

The Haws Sanitary Drinking Faucet Co., of 1808 Harmon Street, Berkeley, Cal., has just issued a very attractive twelve-page booklet illustrating and describing the Haws sanitary drinking faucet, which offers the public an inexpensive, ornate, sanitary uncomplicated device, adaptable to any sink, lavatory or public fountain. The most notable features of this faucet are as follows: No part of it can be dismembered, there is no cup attached to it, and the ball enlargement at the end of the tube being of vitreous China makes it impossible for dirt or germs to remain on or around it, the water washing over it makes it self-cleansing. It is made in several designs to fit any place where water is drawn to drink. It has been installed on public drinking fountains and in public schools and institutions in many cities on the Pa-

cific Coast, and it is said to give universal satisfaction. Parties interested in public drinking fountains can obtain a copy of this neat booklet from the above-named company upon application, mentioning "Domestic Engineering."

A CAMPAIGN OF PUBLICITY ADVERTISING.

A very significant sign of the times is to be seen in the advertising pages of current magazines. The Saturday Evening Post, Country Life in America and other mediums of national circulation are carrying a series of highly attractive educational advertisements on Quick-



One Illustration Used in Magazine Advertising of Central Brass Mfg. Co.

pression Work, made, as the trade knows, by The Central Brass Mfg. Co. of Cleveland.

And the ads are further significant in the fact that every one we have seen tells the reader to go to his plumber and ask to see the goods.

The co-operation of this house with the trade has always been notable. This newest, forward step brings full-circle their complete merchandising plan, whereby manufacturer, plumber and architect work in harmony, educating the consumer to Quick-pression Work advantages and guaranteeing his absolute satisfaction.

The advertisements explain that Quick-pression Work combines the convenience of Fuller work with the durability of compression work, is absolutely noiseless and trouble-proof, and carries a comprehensive guarantee from the manufacturer. Such headings as "Just a Quarter-Turn," "Uniting Beauty and Good Service," "Guaranteed Against Faucet Troubles," etc., are used,

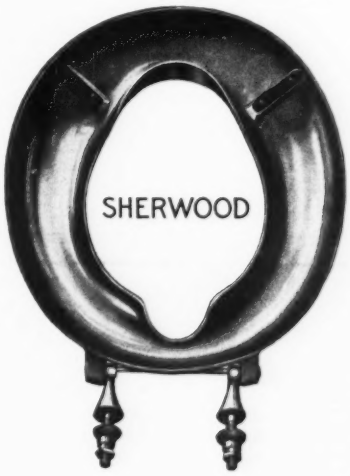
Another of the Illustrations in the Quick-pression Campaign.

and a most attractive form of illustration—more beautiful and more faithful than the ordinary half-tone—is employed in the design.

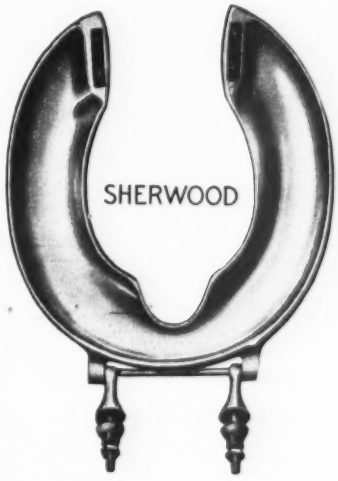
Undoubtedly, Quick-pression Work is an article which can be profitably advertised in national magazines. Plumbers are probably already beginning to feel the effects of the campaign, and "Domestic Engineering" is distinctly glad of this opportunity to call it to the attention of the trade.

Two of the clever photographs used are shown here —by courtesy of The Central Brass Mfg. Company.

THE "SHERWOOD" ALUMINUM TOILET SEATS.



The accompanying illustrations show two styles of the "Sherwood" polished aluminum toilet seats, which have recently been placed on the market to meet the demand for sanitary toilets, and to eliminate the possibility of contagion. It is obvious that a highly polished surface affords no lodging place for germs or vermin, nor can this moisture-proof material retain odors. As these seats are cast in one solid piece of high grade aluminum, it is claimed that the seats will last a life time, because moisture, acids, etc., have no effect upon aluminum, and furthermore, the seats may be cleansed as often as desired, using soap and hot water, thereby retaining indefinitely the initial clean, sanitary appearance, and giving potency to the claim that "the first cost is the only cost." The manufacturers are making a very liberal offer for one sample seat to all plumbers and others who are interested in obtaining improved and efficient sanitary products. Full details, literature and prices may be obtained by addressing Sherwood Brass Works, 1167-1175 Jefferson Ave., Detroit, Mich., mentioning "Domestic Engineering."



MECHANICAL RUBBER CO'S. NEW CATALOG.

The Mechanical Rubber Co., of Cleveland, O., has just issued a comprehensive catalog of plumbers' rubber specialties, in which every conceivable stock article is shown. The goods illustrated are up-to-date and the sizes marked in such a manner that the catalog is a most convenient reference book in its line. The catalog is well printed, profusely illustrated and bound in loose-leaf form. It calls special attention to the fact that the company is

equipped to manufacture any special rubber goods which the plumbing trade may have use for. Interested parties can obtain a copy of this valuable and convenient catalog upon application to the Mechanical Rubber Co., Dept. F., Cleveland, O.

"A HOLE IN THE GROUND."

Wide-Spread interest has been manifested in a booklet issued by the Pittsburg Water Heater Co., Pittsburg, Pa., entitled "A Hole in the Ground." The company states that numerous requests have been received for this booklet from consumers as well as plumbers and gas company officials, showing that the layman is interested in the history of domestic water heating to as great an extent as are plumbing and gas company experts. This book goes back to the time of the aboriginal Indians, when the only method of securing hot water was to heat a stone and push it in a skin-lined hole in the ground that was previously filled with water from a nearby spring or well. The different methods of heating domestic water are followed from that stage up to and including the securing of domestic hot water at the turn of a faucet. It gives interesting side-lights on the way our forefathers used to heat their water and impresses forcibly upon the minds of its readers the wonderful progress we have made in home comforts and luxuries. The writer of the booklet has departed from the usual technical style found in gas appliance booklets, and treats his subject in a newsy non-technical vein, thus giving it a "story-like" flavor. The Pittsburg Water Heater Co., Box 1109, Pittsburg, Pa., will send a copy of this booklet to any person writing for it and mentioning "Domestic Engineering."

A NEW SIX CHASER PIPE DIE HEAD.

The Landis Machine Co., of Waynesboro, Pa., has recently placed on the market a new six-chaser stationary pipe die head, which is said to be extremely simple in construction and applicable to certain pipe machines of the rotating pipe type. A general idea of its operation can be obtained by a glance at the accompanying illustration, Fig. 1, which shows that the head is composed of four major parts, namely: the head body, which carries the chaser slides; the chaser slides; the operating ring, which imparts the oscillating motion of the handle to the chaser slide, giving the chaser a universal radial movement to and from the center; and last, but not least, the long life chaser. Among the most notable feature of this die may be mentioned the line contact the chasers have with the work (see Fig. 2), which reduces the friction to a minimum, and permits very high cutting speeds. This increase in speed is augmented by the flexible rake feature, which is said to obtain the very best cutting condition and successfully thread all grades of pipe, be it iron, brass or copper. As one set of dies cover the entire range on all sizes of standard pipe where the pitch is the same, it is unnecessary to remove the chasers from their holders, except for grinding purposes. Their removal is accomplished by slackening the two chaser clamping screws on chaser holders just enough to allow the chasers to be slipped from their seats. Parties interested can obtain full particulars from the manufacturers upon application, mentioning "Domestic Engineering."

THE VINETTE HOSE COCK ON EXHIBITION.

The Vinette Hose Cock Co., of Pittsfield, Mass., had an exceedingly attractive exhibit at the Industrial Exposition in that city which was recently held under the auspices of the Board of Trade. The accompanying illustration gives the reader a good idea of the exhibit's

The Vinette Hose Cock Co's. Exhibit.

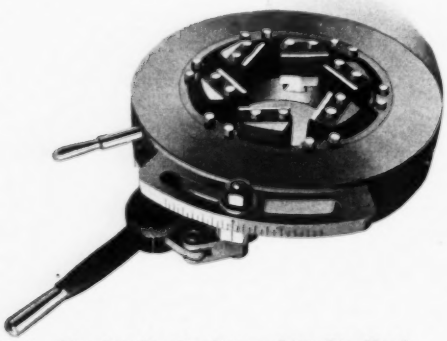


Fig. 1. The Landis Six Chaser Pipe Die Head.

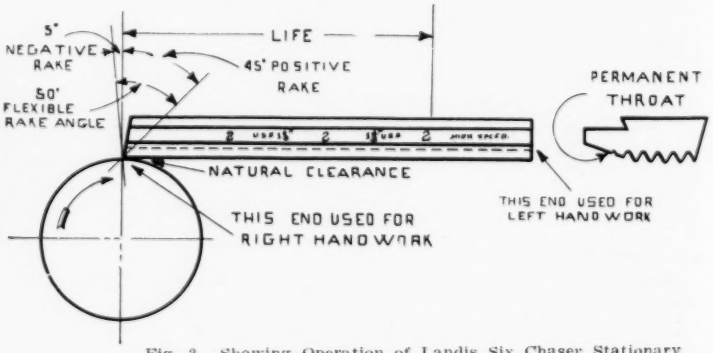
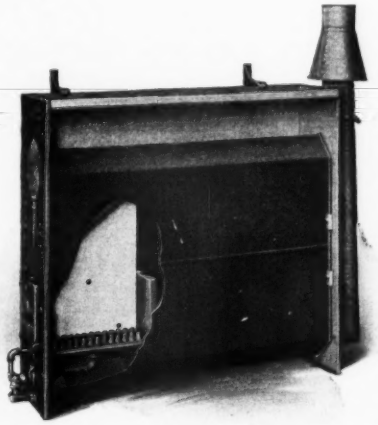


Fig. 2. Showing Operation of Landis Six Chaser Stationary Pipe Die Head.

neatness. Particular attention was given to the company's quick action fire fighter, better nown as the Vinette Fire Hose Cock. This device was shown in different sizes suitable for private residences and stables, public halls and hospitals, factories and store houses. The operation of this device is described as follows: A downward pull on the hose nozzle, hanging always ready, unreels the hose, turns on the water, and a powerful stream with which to fight a blaze is forthcoming at once. The ease of operation, the quickness with which it comes into use and the proven efficiency of this fire cock have won the endorsement of fire underwriters and fire chiefs who have seen it at work. The device is the invention of Michael H. Condron, a member of the plumbing firm of Vinette & Condron, 99 Fenn Street, Pittsfield, Mass.

"PROTECTING YOUR CAR IN WINTER."

"Protecting Your Car in Winter" is the title of an exceedingly attractive twenty-four page booklet just issued by the Scientific Heater Co., 1700 Power Avenue, Cleveland, O., illustrating and describing in detail its Scientific safety garage heater, which will enable automobile owners to start their cars on wintry days as easily as in the summer, besides making their garages comfortable. These heaters are made in sizes to meet the requirements of large and small garages, and they are built of the best and most durable materials obtainable. The burners are removable, and all parts are readily accessible for cleaning and inspection. Extraordinary precautions are taken in the construction to insure absolute safety, every heater being carefully inspected and tested in actual operation before shipment. Parties interested in heaters of this type can secure a copy of this booklet from the manufacturer upon application, mentioning "Domestic Engineering."



The Scientific Safety Garage Heater.

THE TWENTY-SECOND ANNUAL EDITION OF HENDRICKS' COMMERCIAL REGISTER.

The twenty-second annual Revised Edition of Hendricks' Commercial Register of the United States for Buyers and Sellers has just been issued. It has been published annually since 1891, and is the most complete work of its kind in existence. Its aim is to furnish complete classified lists of manufacturers for the benefit of those who want to buy as well as for those who have something to sell. It covers very completely the architectural, engineering, electrical, mechanical, railroad, mining, manufacturing and kindred trades and professions. It is as necessary in the office as the rating book, typewriter or telephone. It establishes a direct link between the buyer and seller. The present is by far the most complete edition of this work so far published. The twenty-first edition required 122 pages to index its contents, while the twenty-second edition requires 138 pages or 16 additional pages. As there are upwards of four hundred classifications on each page, the sixteen additional pages represent the manufacturers of over 6,000 articles, none of which have appeared in any previous edition. The total number of classifications in the book is over 55,000, each representing the manufacturers or dealers of some machine, tool, specialty or material required in the architectural, engineering, mechanical, electrical, railroad, mine and kindred industries. The twenty-first edition numbered 1,546 pages, while the twenty-second edition numbers 1,635 or 89 additional pages. Add to the latter about 348 pages of cancellations, errors, etc., omitted from the present edition, and you have a total of 473 pages of new matter, the whole representing upwards of 390,000 names and addresses. An important feature of this Commercial Register is the simplicity of its classifications. They are so arranged that the book can be used for either purchasing or mailing purposes. As an illustration—all manufacturers of a particular trade are classified under a general heading for mailing purposes, then each firm or corporation is subdivided under as many classifications as every variety of their products call for. By this system of compiling, the book is made of equal value for either the purchasing or sales departments. Again, the value of the Commercial Register for purchasing purposes is not confined to its complete classifications alone, it also gives much information following the names of thousands of firms that is of great assistance to the buyer, and saves the expense of writing to a number of firms for the particular article required. The trade names of all articles classified in the book are also included as far as they can be secured. These trade names appear in parenthesis between the names and addresses under the classifications where they appear. The book is expressed to any part of the country on receipt of ten dollars by the publishers, S. E. Hendricks Co., 74 Lafayette Street, New York City.

FINANCIAL TROUBLES.

Richmond, Va.—J. C. Mettert, surviving member of the plumbing firm of Marsala & Mettert, 2020 East Broad Street, has filed a voluntary petifion in bankruptcy for himself and his firm. The liabilities are scheduled at $6,085.89, and the assets at $2,608.49.

Rochester, N. Y.—Charles P. Marshall, a contracting plumber of this city, has filed a petition in bankruptcy. His liabilities are scheduled at $7,723.90, and his assets at $3,258.60.

New York, N. Y.—The plumbing firm of Weiss & Katz, of 197 Broome Street, has filed a petition in bankruptcy, scheduling its liabilities at $12,498 and its assets at $12,845. Hamilton M. Dawes has been appointed receiver.

Job orders have been issued at Mare Island Yard, Vallejo, Cal., for the installation of a $25,000 salt water flushing system, and work will be started at once. Recommendations have been made that the system be extended next year to the residence section and the barracks.

Light Buying of Pig Iron.

Consumers of pig iron are buying in very limited quantities. Although frequent orders are received by blast furnace interests to forward shipments as early as possible, this does not mean that business is especially active, but quite the contrary; it means that consumers of iron are so skeptical of the situation that they will not keep in their yards any more than a few days' supply. It is evident that the unfilled orders of the U. S. Steel Corporation will show another sharp falling off during the month of October and it is not now believed that the minimum will be reached in this month. Railroads have been buying more freely, especially those affected by the rate decision, being railroads west of the Mississippi. This rate decision has been the most favorable piece of news received by the business world from Washington in a number of months.

Foreign manufacturers of steel bars are making especially low quotations in the Boston and San Francisco markets, and have been able to secure some good contracts on the basis of these low prices. There promises to be a reduction in the output of iron next month.—Quotations are as follows:

No. 1 Northern Foundry, New York	$16.00 to $16.25
No. 2X Northern Foundry, New York	15.75 to 16.00
No. 2 Southern Foundry, Cincinnati	14.50 to 15.00
No. 2 Northern Foundry, Cincinnati	15.25 to 15.75
No. 2 Northern Foundry, Chicago	15.00 to 15.50
No. 2 Southern Foundry, Birmingham	11.25 to 11.50

Copper Market Steady.

Consumers of copper have not been buying in any large quantity and on the other hand there has been no especial weakness in the market, but it is evident that the large buying which has been so prevalent for a long time has ceased for the time being at least. Whether this will be resumed when present supplies are exhausted is hard to tell, but if the copper market is anything like the iron market there is likely to be a distinct falling off in consumption in the next six months. It is the opinion of some of those best versed in trade matters that for the present the highest prices have been seen and at around 17 cents for electrolytic it was better policy to purchase only as absolutely required. It is understood that one of the largest consumers of copper in the United States has been pursuing this policy for the last six months. In New York electrolytic is quoted at 16.62½ to 16.75 cents.

Tin.

The market is somewhat lower and sales of tin in New York have been made at 40.15 cents. The deliveries into consumption during October are estimated at about 3,000 tons and the arrivals will be about 3,500 tons, so there will be a gain in stock of nearly 500 tons. This has resulted in less demand.

Lead.

The market is slightly lower and the leading producer is asking 4.35 cents New York and 4.20 cents St. Louis. Instead of importing lead as was feared under the new tariff, there is a possibility that lead may be exported. This could be done satisfactorily if prices should decline another 20 points.

Spelter.

The market shows a slight improvement, and sales have been made at 5.35 cents New York and 5.20 cents St. Louis.

Old Metals.

New York dealers' buying prices are:

Light copper	$12.50 to $12.75
Strictly crucible copper	14.25 to 14.50
Uncrucibled copper wire	13.75 to 14.00
Uncrucibled heavy copper	13.75 to 14.00
No. 1 machine composition	12.25 to 12.50
No. 1 composition turnings	10.50 to 11.00
New brass clippings	9.75 to 10.00
No. 1 brass turnings	8.25 to 8.50
Cocks and faucets	10.00 to 10.50
Clean red car boxes	11.00 to 11.50
Light brass	7.50 to 7.75
Heavy yellow brass	8.50 to 8.75
Heavy lead	3.75 to 3.80
Tea lead	3.50 to 3.70
Scrap zinc	3.85 to 4.00
No. 1 pewter	27.00 to 28.00
Close cut solder joints	8.00 to 8.25
Block tin pipe	35.00 to 36.00

GOVERNMENT CONTRACTS TO BE AWARDED.

Supervising Architect Oscar Wenderoth, Treasury Department, Washington, D. C., will receive sealed proposals for government work as follows:

Until 3 p. m., November 18, 1913, for the construction complete, including plumbing, heating and lighting, of the United States post office at Mandan, N. D. The building is to be one story with basement, and it will have a ground area of approximately 3,670 square feet.

Until 3 p. m., November 18, 1913, for the construction, including plumbing, heating and lighting of a one story, mezzanine and basement store and brick-faced building with 4,200 square feet of ground area, for the United States post office at Edwardsville, Ill.

Until 3 p. m., November 20, 1913, for the construction, including plumbing, heating and lighting, of the United States post office at Perry, Iowa. This building will be one story and basement and have a ground area of 4,000 square feet.

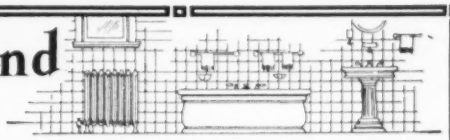
Until 3 p. m., November 22, 1913, for the construction, including plumbing, heating and lighting, of the United States post office at Long Branch, N. J. The building will be two stories and basement and it will have a ground area of approximately 6,470 square feet.

Until 3 p. m., November 26, 1913, for the construction complete, including plumbing, heating and lighting systems, of the United States post office at Albany, Oregon.

Until 3 p. m., November 28, 1913, for the construction, including plumbing, heating and lighting, of the United States post office at Cambridge, O. The building is to be two stories and a basement, with a ground area of approximately 5,370 square feet.

Drawings and specifications for the above work may be obtained from the custodians of the different sites or from the office of the Supervising Architect in Washington, D. C.

Among the Plumbing and Heating Contractors



Illinois

Chicago.

Frank G. Winkler, of 841 North State Street, has secured the contract for installing plumbing in a three-flat building to be constructed at 5011-13-15 Blackstone Avenue. The owner is Dr. J. C. Eigermann, of Chicago.

A. Harvey, of 2439 West North Avenue, will install plumbing and sewerage equipment in a two-flat brick building to be built at 3408 North Harding Avenue.

The plumbing and sewerage contract on a two-flat building to be erected at 4436 North California Avenue has been awarded to J. Krause, of 1721 Dayton Street.

Frank F. E. Pearson, 2643 North Kedzie Avenue, has obtained the contract for plumbing work on a building comprising two flats at 3131 Bernard Street.

Sam Kerstein, of 554 West Jackson Boulevard, will install plumbing fixtures in the new warehouse, engine and boiler room of the T. Johnson Co., 1046 West 38th Street.

J. Zurek, of 2257 Sacramento Avenue, has recently secured the contract for plumbing a building comprising a hall, store and flat at Nineteenth Street and Oakley Avenue.

The heating fixtures in a modern residence to be built at Oak Park, Ill., by W. H. Griffith will be installed by F. C. Irving, of 210 Lake Street, Oak Park.

L. A. Clausen, of 2334 Milwaukee Avenue, has secured the contract for plumbing work on a building to be erected at 2849 North Rockwell Street.

J. Callahan & Co., of 4714 North Albany Avenue, will install plumbing and sewerage equipment in a two-flat building to be constructed at 4844 North Albany Avenue. The owner is Paul F. Wagner, 4709 North Whipple Street.

E. J. Timm, of 1639 Belmont Avenue, has obtained the plumbing contract on a small flat building to be erected at 4534 Christiana Avenue.

E. Englehardt, 169 North Avenue will install heating systems in seven cottages to be built at 5018-36 Park Avenue.

The J. Westwick Co., of 128 West Lake Street, has secured the heating contract for a two-flat building to be erected at 3408-10 North Harding Avenue.

The heating contract on a small flat building, to be constructed at 4844 North Albany Avenue, has been given to F. Lochen, of 4112 North Avenue.

H. P. Sievert, of 3806 Armitage Avenue, has recently secured the contract for plumbing work on a two-flat building to be erected at 4418 Renard Street.

L. Prucha, 3743 26th Street, will install the plumbing and drainage system in a two-story flat building to be constructed at 2513 South Central Park Avenue.

Will H. Daly, Commissioner of Public Works at Portland, Ore., has recommended a bond issue for the purpose of providing water meters throughout the municipal water system.

Michigan

Detroit.

Detroit will be well represented at the Grand Rapids conference, November 11th, when it is expected steps will be taken to organize a state association of builders. Among the plumbers who have already decided to go are E. M. Harrigan and Otto Wurm. Builders in all lines will be there from every part of Michigan. The Detroit delegation will go in special trains.

Through the Detroit office, the C. A. Dunham Co., of Marshalltown, Ia., has been awarded the contracts to furnish the factory of the Havers Motor Car Co., of Port Huron, Mich., with its system of heating; also the new buildings of the Kinsey Mfg. Co., the Willys-Overland Co., and the New Masonic Temple, all of Toledo, O., the installations to be done by local heating contractors.

At a recent convention held in Michigan, of the National Vocational Guidance Association, one of the leading speakers made the remark that although there are more than 9,000 different ways in which Americans gain their livelihoods, occupations that can truly be termed "constant occupations" only number 21, and that to every thousand people in each city there is an average of three plumbers.

Allen & Wood have recently been awarded the plumbing contract in a double veneer residence being erected at the corner of Clairmount and Second Avenues.

Ernst Bros. will install the plumbing in the building at 225 Woodward Avenue, which is undergoing alterations.

Johnson & Larsen will install the plumbing in the theater and brick building in course of erection at Jefferson and Fairview Avenues.

C. H. Dean will install the plumbing in the Wayne Medical Society building on East High Street, which is undergoing alterations.

Architect S. B. Goosen, Detroit, will take figures until Nov. 12th for the erection of a residence on Edison Avenue.

Architect C. F. J. Barnes, Detroit, is taking figures on a veneer residence to be erected on East Grand Boulevard. Bids close November 5th.

O'Connor Bros., Detroit, have been awarded the plumbing and heating contract in Pavilions Nos. 2 and 4 of the Kiefer Hospital.

Other Cities in the State.

It is reported that the board of supervisors in Adrian, Mich., are considering a proposition of having a new heating system installed in the County Court House, as the system now in use is getting old and will give out before long; the radiators are antique and are already causing annoyance.

The Knee Heating Co., of Grand Rapids, have been awarded several good sized contracts recently, two of which are for heating systems in new residences.

Kentucky

Ashland.

Union Plumbing Co. is just completing a $10,000 plumbing and heating job at the Ventura Hotel.

Maysville.

Maysville National Gas & Plumbing Co. is very busy on remodeling work.

C. B. Paul & Bro. have secured the contract for plumbing in a four-suite building on 5th Street, belonging to James Collins.

Ohio

Canton.

Architect W. C. Epperson, of Canton, is ready to take bids on the plumbing, heating and electric wiring for the new $50,000 theatre, store and office building which is being erected in that city, for Bockius Bros.

The city officials are still investigating the question of installing a sewage disposal plant and recently made an inspection trip to Cleveland to investigate the operation of the Imhoff tank system. The city authorities are in conflict over the sort of plant to be erected. Mayor Turnbull both refused to veto and sign the $260,000 bond issue ordinance and it became a law without his signature.

Ironton.

Jos. E. Ourey will soon complete the heating contract at F. J. Goldcamp's residence on Fifth Street.

A. J. Frecka has been awarded the heating in Dr. Miller's residence on Third Street. Mr. Frecka has completed a large number of heating jobs this year and says next year looks very promising.

Portsmouth.

During the Corn Carnival held in this city recently, many of the plumbers, whose shops are in the downtown district, had booths, displaying their goods, on the street and their shops and windows decorated with corn and dressed in other appropriate ways. The windows of The Saunders-Watrous Co. were unique, and while they did not win prizes, they attracted wide attention and drew out much comment from passersby. In one of their windows was displayed all the old-fashioned methods of days gone by, showing the interior of an old-fashioned outhouse with its corn cobs and newspapers, together with the old wooden wash tub which served most efficiently on wash days and Saturday night, while in the other window was shown a modern bathroom, bringing out a very unique contrast, and cleverly showing the progress of sanitation.

On Tuesday evening, Oct. 14th, Portsmouth Master Plumbers held their annual meeting and elected officers. To show their appreciation of the efficient work of President F. B. Burt, Vice-President Barlow and Secretary-Treasurer Watrous, during the past year, the members cast a unanimous vote for their re-election. This organization has made rapid strides toward bettering the plumbing conditions in their locality. At this meeting the following applicants were accepted into membership: Chas. Seeley, Arthur Hunter, Walters Plumbing Co., and West Plumbing Co. After all business was transacted, refreshments and cigars were enjoyed. During the repast City Inspector C. P. Stamm gave a brief but interesting talk and was followed by Wm. Tritcheller, of the Tritcheller Co., who held the attention of the members and made some very valuable suggestions.

West Plumbing Co., is remodeling its store and shop on Seventh Street.

F. B. Burt has started to rough in the plumbing and heating in the new addition to the new school at New Boston, O.

The Schmidt-Watkins Co. has been awarded the plumbing in the Excelsior Shoe Factory and also the plumbing in the new five-story building being erected by the Irwin Drew Co.

Walters Plumbing Co. has started to rough in for heating, ventilating and plumbing in the Temple Theatre.

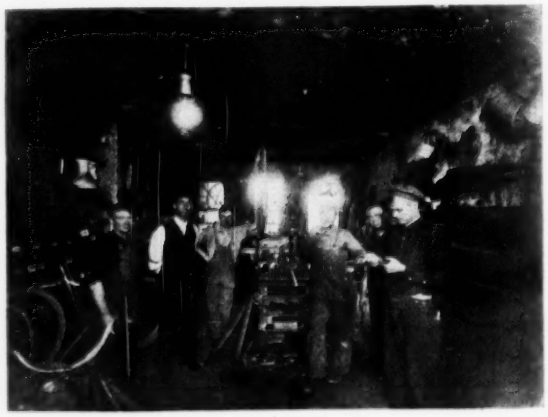
The Tritcheller Co. is contemplating remodeling its store to gain additional store and shop facilities.

"Business Good," Says H. R. Klar.

Business in Uhrichsville, Ohio, has been very satisfactory to H. R. Klar of that city. He has on hand one

Exterior of the Shop of H. R. Klar, Uhrichsville, Ohio.

contract for heating a $45,000 sewer pipe factory, which will keep his men busy for some time to come. A number of other contracts have been signed up within the



Interior of the Shop of H. R. Klar, Uhrichsville, Ohio.

past few weeks, and fall work bids fair to surpass that of any previous year. Two views of his shop are shown herewith, and the number of men employed would seem to indicate that things are prosperous.

Tennessee

Chattanooga.

Knoedler & Meredith, plumbing and heating contractors at 119-121 West Seventh Street, report business good. They are now installing plumbing and heating systems in the new Isolated Ward Hospital at Fort Oglethorpe, Ga.; the new school building at Cleveland, Tenn.; and the new U. S. post office at Abbeville, S. C. They are also installing heating systems in T. H. Payne & Co's. new building and in the residences of George Becking, George Andrews and W. F. Stewart.

Pennsylvania

Pittsburgh and Vicinity.

E. W. Rau, a well known master plumber, whose place of business is located at 4782 Liberty Avenue, recently embarked upon the matrimonial sea, and that is why his many bachelor friends are mourning the loss of his happy companionship. Mr. Rau is considered one of the largest plumbing contractors in the Bloomfield district, having started in a small way, and through close application to cost systems has built up a most profitable business.

The Board of Education of this city has awarded both heating and plumbing contracts for one of the new schools under construction. The Cully Sanitary Co. was awarded the plumbing work while the heating contract went to the F. E. Geisler Co.

George Rome, of Carnegie, Pa., has received the heating contract for the store and apartment building which is being built there by J. J. Joyce.

The Knoxville Plumbing Co., of Pittsburgh, has secured the contract for the plumbing work in the new building being erected by the Freeport Bank at Freeport, Pa.

The Pittsburgh Armature Works Co., of West End, Pittsburgh, Pa., which is erecting a $25,000 factory building, awarded the contract for the plumbing work to Reynold Busse, of this city.

At a cost of $125,000, the Nicola Land Co., with offices in the Farmers Bank Building, will erect a new theatre in the Schenley park district. The plans are being made by Architects H. E. Kennedy Co., of the First National Bank Building. Near the site of this new theatre, ground has been broken for the new Masonic Temple, which will cost close to $1,000,000. Plumbing, heating and lighting contracts on this job will be awarded ere long.

Philadelphia and Vicinity.

Chas. E. Raupp, of 20th and Westmoreland Streets, has the plumbing and heating contract in the property at 22nd Street and Allegheny Avenue, for C. Sachsenmayer. Consideration, $1,500.

Geo. Habgood, of Hawthorne Avenue, Frankford, has been awarded the contract for the plumbing in 4 new houses on Foulkrod Street for Wm. France, and is just completing the plumbing in six houses for C. West & Co.

S. Faith & Co., of Philadelphia, has been awarded the contract for the installation of a heating system in the large residence of R. Filbert, on Pine Road. Consideration, $2,750.

Thos. B. Dale, of Germantown, Pa., is installing new plumbing and heating in the residence of Dr. Wm. H. Nice, on Boynton Street.

Rhodes Bros. Co., of 8th Street and Girard Avenue, is installing the plumbing and heating in the residence of Dr. Jacob on Susquehanna Avenue.

Wm. H. McClain & Co., of 60th Street and Girard Avenue, has been awarded the contract for plumbing 51 new houses for the Maloney Estate.

Schollheimer & Ruetter, of Ridge Avenue, have been awarded the plumbing in the building at 3rd and Market Streets, for Markowitz Bros.

Hoben & Doyle, of 21st and Pine Streets, have been awarded the contract for heating in the same building.

New York

A Youthful Plumber.

Master Herbert Helfrich is one of the coming master plumbers of the metropolis. He has already taken his first lessons in the mechanical rudiments of the trade and his overalls already show signs of honest wear. Master

Master Herbert Helfrich, One of New York's Youngest Plumbers.

Herbert is the son of George Helfrich, a successful New York City plumbing and heating contractor, whose salesroom and shop are located at 1210 Havemeyer Avenue. He has at the present time some large contracts on his books.

Minnesota

St. Paul.

Chas. J. Gustafson, of 786 Jackson Street, has secured the following contracts: Plumbing and heating a duplex residence at 283 East Fourteenth Street, for Fried & Redler; plumbing Ole Finholt's residence at 597 Linden Street; plumbing Richard Moffat's new house at 907 Charlotte Avenue, Hamlin; plumbing Oscar Lindahl's house at 1034 Mathilda Street; plumbing C. Affleck's house at 914 Aldine Street; plumbing M. J. Hartigans duplex building at 539 Capital Boulevard; installing a new bath-room in Julius Olsons residence at 627 Warren Street, and a modern laundry in Jane Crooks residence at 137 Mt. Airy Street. Mr. Gustafson has had a very busy summer, and he expects to be busy far into the winter.

Minneapolis.

Hineline & Co., of 211 South Fifth Street, have secured the following contracts: Plumbing Hennepin Flat Building on Thirteenth Street and Hennepin; there will be 89 fixtures used on this job, besides about a car load of pipe fittings, valves, etc.; plumbing in Josiah Thompson's 18-family flat building at 1816-1826 Fifth Street, South; plumbing in residence at 2711 Pillsbury Avenue; plumbing in two houses at 3819 and 23 Sixth Street, North; contract for installing drinking fountains in the C. M. & St. P. passanger depot at Third Avenue, South, and Washington; and also the following contracts for heating: Garage at 213-15 Sixth Street, South; N. Nelson's residence at 2511 Sixth Street, South; residence for Mr. Lawthon at 1716 South Emerson; building for F. A. Mannen at 1637-41 Hennepin Avenue; residence for James Koblas at Hopkins, Minn., and residence for Mrs. Mary Chimell at Hopkins, Minn. They have also quite a few sewer and water jobs on hand, as well as the plumbing and heating in the new depot for the C. M. & St. P. Ry. Co., at Albert Lea, Minn., and the plumbing in a residence for Mr. C. A. Houck at 4617 Columbus Avenue, in this city.

Washington

Seattle.

Ernst Hardware & Plumbing Co., of 514 Pike Street, has secured plumbing contracts from the following parties: F. V. Cook, 715 Fifth Avenue, North; H. A. Wilson, 908 North 84th Street; Schultz-Marxdoh, 10422 Fifty-seventh Avenue, South; W. F. Herkheimer, 2331 First Avenue, and E. E. Sutton, 135 North Seventy-fourth Street.

E. I. Stebbins, of 1017 Jackson Street, has contracts for plumbing as follows: Swanson & Austin, 3241 Hunter Boulevard, and A. M. Newman, at 3332 Hunter Boulevard.

Hammond & Sessions, of 230 Madison Street, have secured plumbing contracts for the following parties: F. W. Tandy, 7107 Thirty-fifth Avenue, and David Hall, 4531 Eighteenth Avenue, Northeast.

G. A. Schott, 307 North Eighty-third Street, has contracts for plumbing for J. E. Douglas, 8338 Fourteenth Avenue, Northwest, and G. L. Mayer, 7044 Mary Avenue, Northwest.

Kennedy & Tyo, of 2215 East Union Street, have secured the contract for plumbing at 1410 Sixteenth Avenue.

D. H. King, of 214 Columbia Street, has the contracts for plumbing for the following parties: Tracy Strong, 1602 Fifth Avenue, North; Long Building Co., 4226 Stone Way; Long Building Co., 4335 Interlaken Avenue.

McDonald & Schaaf, 980 Vale Street, have secured contracts for plumbing for the following parties: Mrs. Gehring, 6279 Ellis Avenue; L. Zimmerman, 6450 Carleton Avenue; Paul Eberlin, 5570 Sixteenth Avenue, South; Mrs. Boitana, 1226-1226½ Angelo Street.

J. P. Foley, of 166 Jackson Street, has secured contracts for plumbing for J. Zepsie, 1540 Palm Avenue, and R. C. Fuhrberg, 1526 Palm Avenue.

California

San Francisco.

Owing to the general absorption of interest in the celebration of the Portola Festival little new is to be reported in the trade, though a considerable number of large projects are in plan for early construction. A drop in some iron and steel lines by the United States Steel Corporation and its branches and a report of further cuts to come have caused a little uneasiness here. Plumbers are perfectly willing to buy pipe at lower prices; but it is feared that the rumors of lower prices due to the tariff reductions will cause builders to hold up work more or less in the hope that there will be still further reductions.

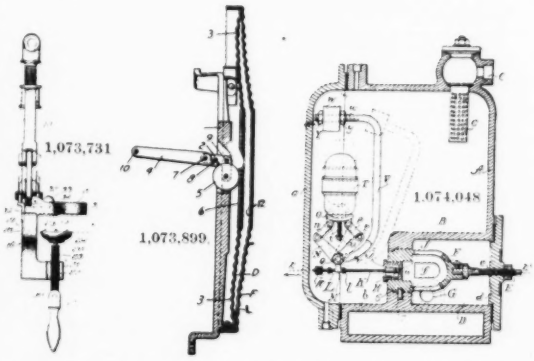
Another matter which is taking the attention of the master plumbers of California is the Workmen's Compensation, Insurance and Safety Act, which takes effect Jan. 1, 1914. This act creates a liability on the part of employers to compensate their employees or their dependents for accidental injury or death in the course of employment, practically irrespective of the fault of either party; provides for the settlement of disputes by the Industrial Accident Commission, which has very broad discretionary powers; creates a state compensation insurance fund to insure employers against such liability; and requires safety in all employments, under the regulation of the Commission. Many inquiries have been made by master plumbers regarding the exact meaning of provisions in this act, and State Secretary J. L. E. Firmin is now endeavoring to work out a brief and intelligible digest of the act, explaining the points upon which doubt has arisen. There is no doubt that the act will cause some increase in the cost of doing business, and some complaint may arise after it takes effect, though so far it has met with comparatively little objection.

While much is expected from the tide of immigration to come via the Panama Canal, it appears that many people in the east are not waiting for the Canal, the number of colonists coming under the special "homeseekers'" rate of the Southern Pacific Railroad being about twice as great as last fall. Over 3,000 immigrants from scattered eastern points came through Reno, Nev., last Sunday alone. Many of the colonists are said to have already purchased land in California, and the class of people coming is said to be much above the average of former years, consisting largely of practical farmers from the Middle West. The many land developments made and subdivisions laid out in the last year have been strong attractions for such people. This colonist movement is regarded as a matter of the highest importance, the common opinion of the trade being that what San Francisco and the state at large needs more than anything else is to fill up the unoccupied country with a producing population.

Patents

Heating Department.

1,073,731. Pipe Vise. Carl Otto Bergman, Evanston, Ill., assignor to Mark Manufacturing Company, Chicago, Ill., a copartnership composed of Anson Mark, Clayton Mark, and Cyrus Mark. In combination with a pipe vise provided with a base having bolting apertures and a rear flange extending downwardly from said base, a clamping member being formed with a top face, a rear wall extending downwardly therefrom, and a projecting portion extending forwardly from the lower part of said rear wall, engaging arms projecting forwardly from the rear wall and top face of said clamping member, said arms being upwardly bent and formed with offset heads at their upper extremities, said heads being provided on their under forward portions with flat faces adapted to contact with the upper face of the base of said vise when said engaging arms are inserted through the bolting apertures in the base of said pipe vise, the bottom portion of said clamping member being provided with a threaded aperture, and a threaded screw passing through and in engagement with said threaded aperture, said threaded screw carrying a clamping plate at its upper extremity, said clamping plate having a ball and socket connection with the upper extremity of said threaded screw and being provided with engaging spurs or studs on its upper face, said clamping member being adapted to contact with the under surface of a supporting means.



1,073,899. Thermostat. Edward S. Halsey, Lynn, Mass. A thermostatic motor consisting of a chamber having oppositely arranged walls, one of which walls is movable toward and from the other, and in the normal contracted condition of the motor is close to said other wall, a working fluid which at atmospheric pressure is entirely liquid at 66 deg. Fahrenheit, completely filling the space between said walls in the contracted condition of the motor, said fluid being completely gaseous under the atmospheric pressure at a temperature of approximately 73 deg. Fahrenheit.

1,074,048. Steam Trap. George N. Graham, New York, N. Y. In a steam trap, the combination with a casing comprising a main portion having an interiorly-projecting portion and a base, the said projecting portion and base being constructed and arranged to form a chamber between them, the said chamber having discharge outlets and

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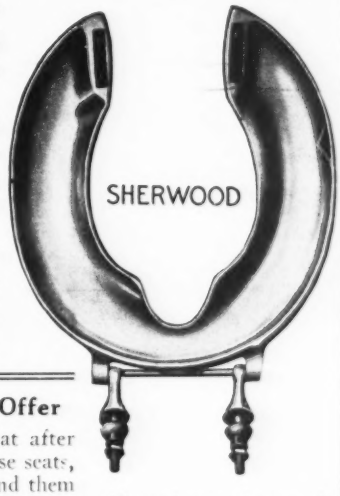

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Plate B-302

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PLUMBERS & STEAMFITTERS BRASS GOODS

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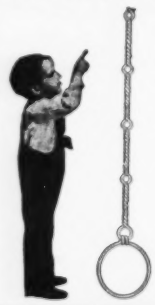
DAD PIPE HANGER



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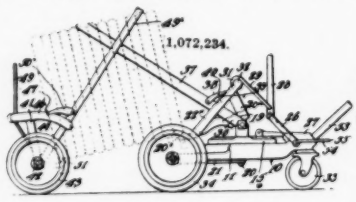
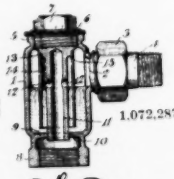
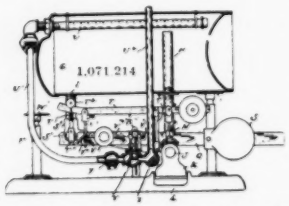
Cincinnati, Ohio

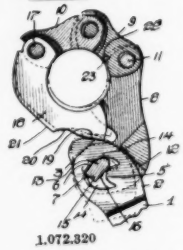
an open end, of a head constructed to close the end of the chamber, a cage having a stem passing outwardly through said head, means acting upon the stem and constructed to clamp the said head upon the open end of the chamber, the inner wall of said chamber being apertured to receive the end of said cage, means constructed to removably secure said end of the cage, the cage being removable through said chamber, a device having a valve seat, the said end of the cage being apertured to receive and engage said device, a valve and valve rod movably supported upon the cage and removable therewith, and float-operated means constructed and arranged to actuate the valve rod.

1,072,234. Radiator Truck. Richard Irwin, Farmington, Mo. In a device of the class described the combination of, a front supporting member comprising a frame, wheels supporting said frame, a rotatable member carried by said frame, a radiator supporting member pivotally connected to said rotatable member a yoke privotally connected to said rotatable member adapted to hold said radiator supporting member in an active position, a rear supporting member comprising a frame, two wheels connected thereto, said front and rear radiator supporting members being held in spaced relation by a radiator interposed there-between and carried thereon, a radiator supporting member carried by said rear frame, a yoke pivotally supported thereon and adapted to hold said rear radiator supporting member in an active position.







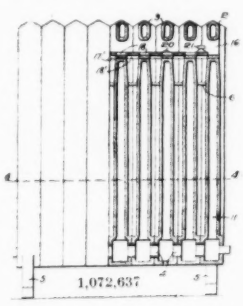


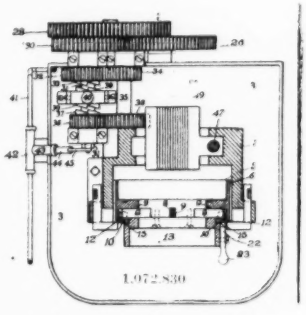
1,072,287. Water Seal Radiator Trap. Edgar C. Wiley, Lynchburg, Va: A water-seal trap for steam radiators, comprising a casing with an inlet and an outlet, and a web with a central opening and defining the bottom of a chamber within the casing between the inlet and the outlet, and a readily removable plug introducible into the casing through the end thereof remote from the outlet and shaped to receive the plug, the latter carrying two cencentric tubular members, the outer one of which is of a length to stop short of the web and the inner one of which is of a length and diameter to extend through and closely fit the opening in the web, such inner tube having a passage through its walls between the plug and web, the inner diameter of the casing about the tubular members being related to the outer diameter of the outer tubular member and the inner diameter of the outer tubular member being related to the outer diameter of the inner tubular member to provide a space between the two tubular members of less diameter than between the outer member and the casing and of less diameter than the passage through the walls of the inner tubular member.

1,071,214. Vacuum Steam-Heating System. William H.

Crowley, Marine City, and Augustus Fitzgerald, Detroit, Mich., assignors to Morehead Manufacturing Company, Detroit, Mich., a corporation of Michigan. In an automatic trap, the combination of a rockable receptacle having a check controlled inlet for water of condensation, and a check controlled discharge, a sprinkler arranged in the upper portion of said receptacle, a valve controlling the same, a valve controlled steam inlet to the upper portion of said receptacle, a weighted lever operated by the accumulation of water within said receptacle, a seat formed in one end of said levers, a link, one end of which is adapted to be received by said seat and having its remaining end connected with valve operating mechanism, to close said sprinkler valve and open said steam valve, whereby the accumulated water is ejected under the pressure of steam and for reversing said valves by the opposite tilting of said receptacle when relieved from weight of the water, whereby the steam atmosphere will be condensed by the sprinkler and a vacuum will be placed on the steam system.

1,072,320. Pipe Wrench. Charles L. Dunham, Sistersville, W. Va. In a pipe wrench, a handle or lever having a head provided with a substantially crescent-shaped opening, link sections, and a pivot pin carried by one of said sections and extending through said opening, said pivot pin being substantially rectangular and presenting a flat gripping surface adapted to be engaged by one of the walls of said opening.





1,072,637. Radiator. Ernest A. Newman, Woburn, Mass. A steam radiator composed of a series of communicating sections having outer, exposed side walls and top radiating walls between which latter the heated air may be discharged, the adjoining side walls of said sections being in continuous contact and the end sections having closed end walls, said sections having inner radiating walls and means for admitting air thereto at the lower portion thereof, and a damper adjacent the top of the radiator but below the top radiating walls thereof, and adapted when closed wholly to prevent the egress of air from said radiator.

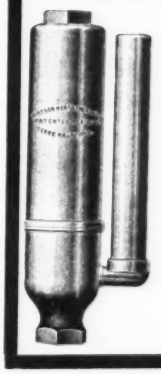
1,072,830. Pipe-Threading Machine. Lewis B. Curtis, Bridgeport, Conn. In a pipe-threading machine, a die holder, a support within which said holder is movable rotatably and axially, means for providing such movements, a cam ring extending within the planes of the holder, and an annular chip shedder secured to the holder and movable therewith, said shedder having an annular shoulder adapted to overhang and retain said cam ring in position, the shedder annulus having a cam member pivoted to its periphery and adapted to co-operate with the exposed portion of the cam ring face to clamp the ring in adjusted position, said cam member having its pivot extending in a direction transverse to the axis of the cam ring.

1,072,874. Combined Water Heater and Steam Generator. James J. Rohan, St. Louis, Mo., assignor to Mis-

The Crawford Combination Bath Trap

Simplifies the installation of a bath tub to a minimum.
Attaches directly to the tub comprising a trap, waste and overflow all in one fixture.
Has 2⅜" water seal.
Elbow may be furnished on outlet instead of union.
Saves time and money and adds to the appearance of the bathroom.
Prices on application.

Crawford Specialty Co.
115 Dartmouth St. Boston, Mass.



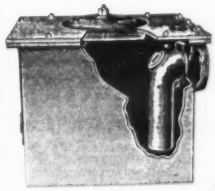
One — Only — One

That's right — there's only one generator—and that's **The Masterpiece** possessing these qualities:
Always retains 10 lbs. pressure.
After discharging reseats at not less than 9 lbs. thus losing no heat already gained.
Perfect, simple, attractive and inexpensive—in short THE MASTERPIECE. Manufactured by

THE WATSON SPECIALTY CO.
Terre Haute, Ind.

GREASE MAY BE SLICK BUT IT CAN'T AVOID THIS TRAP

There's not a kitchen sink made that doesn't need the



BOSTON GREASE TRAP

The BOSTON is the easiest installed, the easiest cleaned, the most reliable and the best trap made for eliminating grease-clogged pipes.

We give full particulars on request and name attractive discounts.

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1st and C Streets, SOUTH BOSTON, MASS

"AMERICAN"
ANTI-SYPHON AND RESEALING TRAPS
Are the best that experienced and competent workmanship can produce
FROM AN ARTISTIC
AS WELL AS
SANITARY POINT OF VIEW

Deep water seal—over 7". Full waterway. Ground joint at outlet. Artistic in design. Superior in finish. Castings smooth inside and out.

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THE BOWLUS

Auto Pneu **MATIC** Water Closet

Simple Sanitation—Neat Economy

In use in all sections of the U. S.

Has But One Active Part

Guaranteed Positive in Operation

Adaptable for Buildings of Every Character

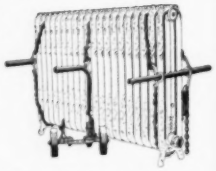
For Schools, Our Juvenile Bowl; A Profit Maker and a Business Getter. Write Us or Consult Your Jobber

The Bowlus Mfg. Co.

Springfield, Ohio

PAYS FOR ITSELF ON THE FIRST JOB

Because it is strong, and adjustable for carrying the largest radiators **quickly** up and down narrow crooked stairways and halls,



BUELL'S COMBINED CARRIER AND TRUCK

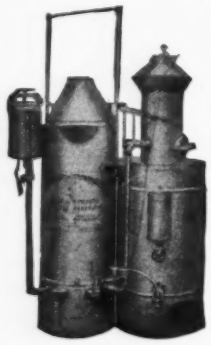
pays for itself on the first job.

No matter where radiation is desired you will find our **Carrier** saves labor, time and strength.

It is justly **known everywhere as the steamfitter's best friend.**

Write for details and prices.

BUELL BROTHERS, Fulton, N. Y.



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Ideal Epworth Acetylene Co.

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Branch Offices:
Waterloo, Iowa **Anderson, S. C.**

Weighs no more than a pair of boots,

but it's tested to a load of 1000 lbs.
A very low-priced adjustable boiler stand for boilers of any make, 30, 35 or 40 gals. **No bolts.** Weight, about 5 lbs. Height, 13¼ inches. The fitter will appreciate large space under boiler. Lots of 100 or more? Get jobber's prices.

C. H. FOSTER
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Floor Flanges **Eccentric Reducers**
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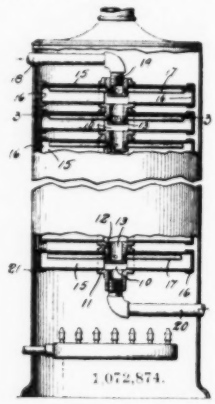
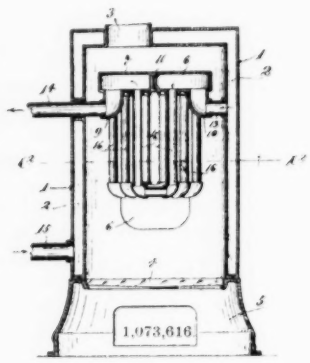
Pipe Hangers **Sink Brackets** **Cesspools**

M O D E R N
IRON WORKS **QUINCY, ILL.**

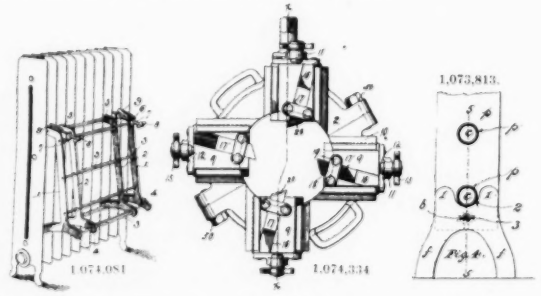
souri Gas Heater & Appliance Company, St. Louis, Mo., a corporation of Missouri. In a combined heater and steam generator a vertically disposed sectional column formed by a series of hollow joint members, a portion of each of which extends into and is screw seated in an adjacent joint member, a series of heating pipes connected to each section of the column, and a series of circulating pipes connected to each section of the column.





1,073,616. Hot-Water Heater. Clarence W. Moon and Irwin Moore, Minneapolis, Minn. In a hot-water heater, the combination with a body shell having a water jacket, of a two-compartment water head within said shell, a connection between the water jacket of said main shell and one compartment of said water head, tubes connecting the compartments of said water head, and a hot-water delivery pipe leading from the other compartment of said water head, the said water head having smoke passages extending therethrough, and the said water tubes connecting the compartments of said water head being U-shaped form and depending from said head.

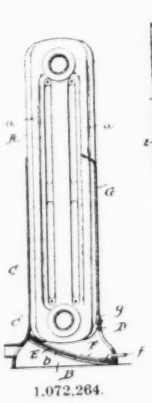
1,074,081. Radiator Foot Rest. Ebon B. Bower, Bellefonte, Pa. A foot rest for radiators consisting of like sections, each of the sections comprising an inner and an outer upright having inner lateral extensions at their upper ends and cross pieces at their lower ends, and longitudinal rods supported at their ends in the uprights and the lateral extensions and cross pieces thereof and connecting the same, the rods of one section passing loosely through the inner upright, lateral extension and cross piece of the other section and vice versa, and means applied to the lateral extensions of the outer uprights to secure the foot rest to a radiator in elevated position.



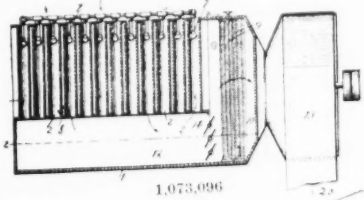
1,074,334. Pipe-Cutting Machine. William W. Vosper, Toledo, Ohio, assignor to The Toledo Pipe Threading Machine Company, Toledo, Ohio, a corporation of Ohio. In a machine of the class described, the combination of a work-holding collar having its inner end recessed to form an annular circumferential groove having an outwardly

tapered base portion, said collar also having a pinion-receiving socket in one side thereof, said socket being substantially the depth of said recess and open at one side to the recess, a die-carrying head having an opening therein in register with the annular opening and seating at its inner edge against the inner end of the collar and having a concentric annular flange on its inner side with its inner edge complemental to the tapered base of the collar recess to have rotary dove-tailed engagement therewith to retain the collar and head in assembled relation, the outer end of said flange being toothed with the teeth thereof protected by the inner wall of the collar recess, a stub-shaft projecting from the collar centrally within the socket thereof, and a drive pinion mounted on said shaft in mesh with the teeth on the head flange with its teeth protected by the wall of said socket except at the point of meshing thereof with the flange teeth.

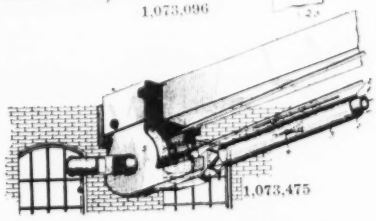
1,073,813. Heat Radiator. Alvin B. Neiman, New York, N. Y. In combination with a radiator having a lower cylindrical member and depending flanges, foot pieces fitting snugly between said flanges, each being formed with a semi-circular seat for said lower cylindrical member, said seat being of greater radius than that of the cross section of said cylindrical member, each foot piece being also formed with a bolt hole of greater diameter than that of the securing bolts, together with said securing bolts, and nuts clamping the flanges to the foot pieces.



1,072,264.



1,073,096.



1,073,475.

1,072,264. Ventilating Radiator. Oliver Perry Simler, Johnstown, Pa., assignor to Union Radiator Company, a corporation of Pennsylvania. A radiator comprising a plurality of radiator sections, each having corrugations, an inclosure for the lower portion of the radiator, a portion of the front of said inclosure being formed of a plurality of strips alternating with the sections, and laterally extending projections on the upper ends of the strips, said projections having recesses for interlocking with the corrugations of the sections; substantially as described.

1,073,096. Air-Conditioning Apparatus. Stuart W. Cramer, Charlotte, N. C. In an air-conditioning apparatus, an air chamber, tubes within said chamber, spray heads for moistening, cooling and inducing a current of air through said tubes, a fan, and means for separating the air proceeding from the air chamber and the moistened air from the tubes.

1,073,475. Air-Conditioning Apparatus. Stuart W. Cramer, Charlotte, N. C. In an air-conditioning apparatus, an air chamber, a fan for producing a current of air through the air chamber, a spray chamber within said air chamber, spray heads for moistening, cooling and inducing a secondary current of air through said spray chamber, and means for controlling the supply of air from said fans.

NO. 20 FIRE POT

Price each
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A Steady Blue Flame

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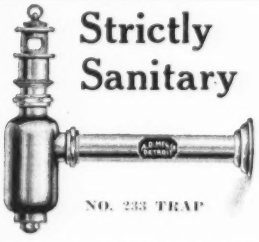

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Strictly Sanitary

The A. D. M. Co.'s High Grade line of Cast Brass, Deep Seal, and Bent Tube Traps and Wastes is constructed of the best materials, and all castings are free from sand holes. All solid joints are reamed to a drive fit and flame soldered, making smooth, tight joints.

We are in position to supply ground joints when required. A. D. Traps have extra deep water seals, insuring perfect sanitation. Our extra long slip joint connections permit of easy installation on either old or new work.

All stock is pleasing in design and finished in heavy white triple nickel plate.

Your nearest jobber will supply at factory price. Cash must accompany orders when sent to the factory. Write for Booklet with Discount Sheet—it will save you dollars.

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Is the only radical improvement in Hot Water Heating for a score of years

Makes Hot Water Heat cost less to install than Hot Air or Steam Heating. Saves Time, Labor, Fuel and Material.

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Miscellaneous.

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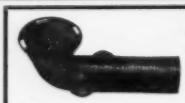
WANTED—A PROMINENT MANUFACturer of brass valves is looking for first class design of Packless Radiator Valve; one which can be manufactured and sold at but little higher price than the ordinary valve. Will consider royalty or purchase plan. Submit sketch of design with reply. Address Box 1019, care "Domestic Engineering," Chicago. 10-25: 1-8-15

Government Proposals.

TREASURY DEPARTMENT, SUPERvising Architect's office. Washington, D. C., October 30, 1913. Sealed proposals will be received at this office until 3 p. m., November 27, 1913, and then opened, for a new toilet room, etc., in the U. S. Post Office, Kalamazoo, Mich., in accordance with specification and drawing, copies of which may be had at this office or from custodian of the building, in the discretion of the Supervising Architect. O. Wenderoth, Supervising Architect. 11-1, 8, 15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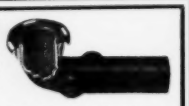
Conforms with codes of nearly every city and state in the U. S. A. Recommended by master plumbers as a TIME SAVER.



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Sell her one, Mr. Dealer, and get in the ladies' friend class yourself.

D. L. Bates & Bro. Co. - Dayton, Ohio

Dollar Back Wiping Clamps

Write us about them

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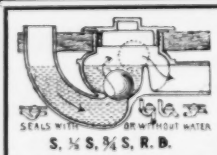

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For Wash Bowls, Sinks, Baths and Wash Tubs

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